PROJECT STUDY PLAN

CHATHAM COUNTY, GEORGIA
REGIONAL FLOOD CONTROL STUDY

Prepared By:

U.S. Army Corps of Engineers

Savannah District

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I. Reconnaissance Overview

This document outlines the Project Study Plan (PSP) prepared in accordance with Engineering Regulation (ER) 5-2-1 dated July 1989, and ER 1105-2-100 dated 28 December 1990. The purpose of the feasibility study is to develop and evaluate alternatives for implementing solutions to frequent flooding problems in Chatham County, Georgia. This PSP has been developed as a cooperative effort by the Savannah District of the U.S. Army Corps of Engineers and the prospective local sponsor, Chatham County, Georgia.

This PSP describes the scope, schedule, and budget for accomplishing feasibility study tasks. This document also includes:

- a critical path method (CPM) network diagram that shows the logic and interrelationships of tasks;
- a detailed project schedule (Gantt chart);
- cost summary tables;
- detailed work task descriptions and a work breakdown structure;
- the division of responsibilities to be accomplished during the study by the Savannah District and the non-Federal sponsor (and its designees); and
- a Quality Control/Internal Technical Review Plan.

This PSP has been prepared by the Savannah District in consultation with the non-Federal sponsor. Upon certification by Headquarters, U.S. Army Corps of Engineers, and the Assistant Secretary of the Army, Civil Works, the plan will be finalized and the Feasibility Cost Sharing Agreement (FCSA) will be negotiated between the Savannah District and the non-Federal sponsor.

A. Study Authorization

The Chatham County, Georgia, Regional Flood Control Study is being carried out under the Corps of Engineers' General Investigations (GI) Program. The study was authorized by a resolution of the Committee on Transportation and Infrastructure of the U.S. House of Representatives, dated September 14, 1996.

> *"Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That, the Secretary of the Army is requested to review the report of the Chief of Engineers on the Savannah River, Georgia, published as House*

Document 657, 78th Congress, and other pertinent reports with a view to determining whether any modification of recommendations contained therein is desirable at this time, in the interest of flood damage reduction for the City of Savannah and contiguous areas of Georgia."

The reconnaissance phase was funded with $100,000 of Federal Fiscal Year 1996 funds.

B. Study Area Description

Chatham County is located on the Savannah River and is bordered on the north by Beaufort County, SC; on the east by Barrier Islands; and on the west by Effingham County; and by Bryan County on the south and west. The study area incorporates all of Chatham County, with the exception of three canals within the city of Savannah which are part of a separate study.

The Chatham County study includes four canals: Placentia Canal, Dundee Canal, Pipemakers Canal, and Hardin Canal. Each canal has a separate drainage basin, and all are delineated on the enclosed map. Eight municipalities are contained within the study area. They are the cities of Savannah, Pooler, Garden City, Port Wentworth, Bloomingdale, Thunderbolt, Tybee, and Vernonburg. Chatham County, located in the coastal plain of the southeastern part of the state of Georgia, has an area of approximately 443 square miles. In the 1995 census, the population of Chatham County was 226,160.

C. Statement of Problems and Opportunities

The primary objectives of the reconnaissance phase are to:

a) Determine whether the flooding problems of Chatham County warrant Federal participation in a feasibility study;

b) Define the Federal interest, consistent with Army policies, costs, benefits and environmental impacts;

c) Prepare a Project Study Plan (PSP); and

d) Assess the level of interest and support from non-Federal entities in cost sharing for the feasibility phase and project construction.

Streams whose flooding results in damages to residential and nonresidential properties within the County include:

1. Placentia Canal
2. Dundee Canal
3. Pipemakers Canal
4. Hardin Canal

The principal focus of the Section 905(b) (WRDA 86) Preliminary Analysis Report was to identify flood damage reduction opportunities within Chatham County. A review of existing information and field reconnaissance identified and evaluated several damage centers within

Savannah and Chatham County. Potential opportunities identified during the reconnaissance study include the following:

- A number of structural measures appear to be feasible along portions of Placentia Canal and its vicinity. Levees, channel widening, bridge and culvert enlargement, tide gate enlargement, a pumping station and a floodwater diversion canal are recommended for further study in the feasibility phase of the project.
- A number of structural measures appear to be feasible along portions of Dundee Canal and its vicinity. Channel widening, bridge and culvert replacement, tide gate enlargement and a pumping station are recommended for further study in the feasibility phase of the project.
- A number of structural measures appear to be feasible along portions of Pipemakers and Hardin Canals. Channel widening, man-made cross drainage canals, bridge and culvert enlargement, detention ponds, and a pumping station are recommended for further study in the feasibility phase of the project.

D. Without Project Conditions

D.1 Existing Conditions

The growth being experienced by Savannah has been reflected by a corresponding growth in the unincorporated areas of Chatham County. This was evident during the 1994 flood in Chatham County which left several hundred people homeless, and caused over $10 million dollars in flood damages. After this flood, which was estimated to be a 75-100 year event, Chatham County and the municipalities in Chatham County including the city of Savannah began to look for ways to reduce these damages in the future. The city of Savannah and Chatham County work jointly on some projects, but have separate designated creeks and canals they maintain independently. A capital improvement program to improve drainage and reduce flooding in Chatham County is underway and the Corps is a task force member. Many creeks and canals are scheduled for further study while some canals have flood reduction improvements planned. Given these local efforts, we will be working closely with the local sponsor to determine Federal interest in these flood reduction measures. Four canals within the jurisdiction of Chatham County have the potential for Federal interest and warrant further study, including: Placentia Canal, Dundee Canal, Pipemakers Canal, and Hardin Canal. Attachments to the 905(b) Report contain detailed descriptions of each area's identified problems, a discussion of the array of possible alternatives, and an evaluation of the likely environmental impacts of alternative solutions.

D.2 Future Without Project Conditions

Little change from the current trend is expected without the implementation of new flood damage reduction projects or modifications to existing projects. If no action is taken to implement a new flood control project (or project improvements) in Chatham County and its vicinity, floods similar to the 1994 event will continue to occur and recurring damages are likely.

Chatham County currently participates in the flood insurance program and has had a floodplain ordinance in effect since 1980. Therefore, all new development in the 100-year floodplain must be elevated to at least one foot above the 100-year flood elevation. However, damages to existing commercial and industrial establishments will continue and are likely to increase as existing businesses expand and as even more intensified development occurs in the watershed. This will contribute to further reductions in the level of protection provided by the existing projects. At the present time, the existing projects are effective for low level nuisance flooding, but can no longer significantly reduce damages from larger flood events. Further, the existing projects provide minimal protection in previously undeveloped reaches which now contain high value commercial and industrial establishments. Substantial recurring flood losses are expected.

E. Alternatives to be Considered in the Feasibility Study

Structural measures appear to be feasible along portions of Placentia Canal, Dundee Canal, Pipemakers Canal and Hardin Canal located in Chatham and its vicinity. Levees and/or floodwalls, detention ponds, diversions, bridge and culvert modifications, and additional channel work is recommended for further study in the feasibility phase of the project.

A number of flood reduction measures appear to be feasible in the Placentia Canal area such as: channel widening, bridge and culvert enlargement, tide gate enlargement, and a pumping station. A combination of these alternatives would eliminate riverine flooding for the lower frequency floods. An existing Chatham County flood control plan calls for improvements to Placentia Canal downstream of Shell Road. We envision a Federal project focused upstream of Shell Road, the most likely alternative consisting of approximately one mile of levee from Sunset Blvd. to Tompkins Road, culvert replacement at Shell Road, and channel improvement from Shell Road to Sunset Blvd. Another possible alternative would include floodwater diversion from Placentia Canal into Williamson Creek.

A number of flood reduction measures appear to be feasible in the Dundee Canal area, including: channel widening, bridge and culvert enlargement, tide gate enlargement, and a pumping station. A combination of these alternatives would eliminate riverine flooding for the lower frequency floods. Potential improvements to Dundee Canal include approximately two miles of channel improvements from Alfred Street to the SCL Railroad on the mainstream and from the mouth to Alfred Street on Tributary A; culvert enlargements at Alfred Street and three railroad crossings on the mainstream and at Highway 80 and the railroad spur on Tributary A; as well as a detention pond on Tributary A.

A number of flood reduction measures appear to be feasible in the Pipemakers and Hardin Canal area, such as channel widening, man-made cross drainage canals, and bridge and culvert enlargement. Pumping stations are also a possibility for the canals.

The Section 905(b) (WRDA 86) Preliminary Analysis Report recommended that the Federal government proceed to the feasibility phase and initiate cost-shared feasibility studies to identify flood damage reduction projects for Chatham County. A comprehensive, watershed based approach to identifying problems and opportunities will be used to identify and prioritize flood damage reduction alternatives during the feasibility phase.

II. Scope of Studies

This section of the Project Study Plan (PSP) provides a definition of the products and a description of the tasks to be accomplished during the course of the feasibility study. A complete listing of the tasks which must be accomplished in order to meet all applicable Federal laws, statutes and policies is provided first. The majority of this section of the PSP is devoted to specific descriptions of each feasibility study task, including: the technical studies and investigations to be accomplished; the reasons for each task; the techniques, models, and procedures to be used; the organizational elements responsible for each task; and the timing, schedule and cost of each task. Relationships and dependencies between tasks are addressed in Section V, Feasibility Study Schedule.

The organization and description of feasibility study tasks follows the U.S. Army Corps of Engineers Civil Works Breakdown Structure (CWBS) definitions (10 September 1997 Revisions to the 30 November 1993 draft). The CWBS follows a hierarchical organization and provides a breakdown of products, sub-products, major tasks/work elements, and tasks/activities required to produce a feasibility study in increasing levels of detail and specificity.

A. Review of Feasibility Study Products

Four major products will be produced during the feasibility phase. Each of these major products is described below.

1. Feasibility Report
2. Preliminary Project Cooperation Agreement (PCA) and Financing Plan
3. Draft Project Management Plan (PMP)
4. Other Supporting Plans

1. Feasibility Report

This product includes all activities leading to approval of the final Feasibility Report and NEPA document by Headquarters, USACE, and the Office of the Assistant Secretary of the Army (Civil Works). It will describe all of the problem identification and formulation activities which were conducted during the feasibility phase to identify and recommend plans of improvement. It will also include a required NEPA compliance document which will describe all activities leading to the assessment of environmental impacts related to the various projects being investigated. NEPA activities will include: scoping and preparation of the environmental document; public coordination and review and notification of findings; Section 106 and other environmental compliance documentation; coordination of the study and results with all interested parties; initial and final review by the South Atlantic Division; policy review by Headquarters, USACE; and ultimately transmittal to Congress. The feasibility study will culminate in the Notice of the Division Engineer. Assuming a May 1, 1998 feasibility study start, the Final Feasibility Report is scheduled for completion on May 25, 2000 (25 months).

2. Preliminary PCA and Financing Plan

As recommended plans are finalized, coordination will take place between the Corps of Engineers and the non-Federal sponsor to review the model language for the Project Cooperation Agreement (PCA) for the proposed project(s). Letters of intent that acknowledge the requirements of local cooperation and express good faith intent to provide required items of local cooperation for the recommended project(s) will be developed by the non-Federal sponsor. Preliminary financing plan(s) will be developed by the non-Federal sponsor describing its plans for financing the local share of the cost of the project(s). The Savannah District will prepare an assessment of the non-Federal sponsor's capability to implement the financing plans and will perform an ability to pay analysis. Coordination of the PCA model and the preliminary financing plan will be completed concurrent with the draft feasibility report.

3. Draft Project Management Plan (PMP)

As part of the feasibility study, a draft Project Management Plan will be prepared based on the recommended projects. A baseline cost estimate will be developed and the draft PMP will address the schedule and cost of Preconstruction Engineering and Design (PE&D) and construction activities. These activities will include preparation of plans and specifications for the initial construction contracts. The draft PMP will address the development of additional products and detailed plans for successful management and completion of the projects. The draft PMP will be completed concurrent with the draft feasibility report.

4. Other Supporting Plans

Other supporting plans will be developed as needed as the study progresses to address specific items such as local cooperation, real estate acquisition, quality control, value engineering, environmental and cultural resources, safety and security, and project operation and maintenance.

B. Description of Tasks Required to Produce Products, Analyze Alternatives, and Determine Feasibility

The purpose of this section of the PSP is to describe the products, sub-products, major tasks/work elements, and tasks/activities required to produce the feasibility study. Tasks are organized according to the U.S. Army Corps of Engineers Civil Works Breakdown Structure (CWBS) definitions (10 September 1997 Revisions to the 30 November 1993 draft).

Product J Feasibility Report

The Feasibility Study is the second phase of the Corps of Engineers planning process and follows a favorable Reconnaissance Report and execution of a Feasibility Cost Sharing Agreement (FCSA) between the Corps of Engineers and the non-Federal sponsor. The purpose of the Feasibility Study is to fully evaluate all reasonable solutions to the problems identified during the reconnaissance phase. The Feasibility Report documents the planning, engineering, design and real estate activities required to provide a basis for a decision on Federal participation in the construction of a project.

The Feasibility Report is a complete decision document which presents the results of the reconnaissance and feasibility phases and provides the basis for recommending the construction of a project and preparation of a Design Memorandum (if necessary) and Plans and Specifications during the Preconstruction Engineering and Design phase. The feasibility report will present recommendations for Federal action. Upon approval by HQUSACE and the Office of the Assistant Secretary of the Army (Civil Works), these recommendations will be formally transmitted to Congress to support a project authorization decision.

The feasibility report will be prepared in accordance with the guidance contained in the Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies (1983) and Guidance for Conducting Civil Works Planning Studies (ER 1105-2-100, 28 December 1990).

Sub-Product JA Engineering Appendix

An Engineering Appendix will be prepared that supports the alternative analysis and the recommended plan as shown in the Feasibility Report. The Engineering Appendix will be prepared at a level of detail necessary to develop a defensible baseline cost estimate that addresses all pertinent cost factors with adequate contingency factors. The Engineering Appendix will document the results of all of the engineering investigations conducted during the feasibility phase, including: surveying and mapping, hydrology and hydraulics studies, geotechnical investigations, site investigations, design analysis, and cost estimating. The Engineering Appendix will be prepared by the Savannah District's Engineering Division (or their Contractor) and will be scheduled for completion in time to be incorporated into the draft Feasibility Report. The schedule and cost of required engineering technical investigations are detailed below.

Major Task JAA Surveying and Mapping

Floodplain mapping is required for flood routing to delineate overbank flows and for civil and hydraulic design and economic analysis activities. Prior surveys and plans prepared by Chatham County will be used as much as possible. The USGS, NRCS, and State planning agencies and universities will be contacted to locate and obtain any existing surveying and mapping data. Recent and historical aerial photography will also be obtained from available sources. Surveying and mapping activities described below will be conducted by the Savannah District or Chatham County.

Task JAAA Topographic Mapping

Aerial surveys will be conducted to develop a terrain model and define potential detention basin area(s) along the drainage basins of the four canals. Topographic data will include top of bank, bottom of bank, edge of water, bridges and culverts, road profiles, inverts and opening sizes, and any other significant topographic or man-made features. Topographic maps showing one foot contours will be prepared for approximately one half of the total 17.7 acre drainage area and provided to the project designers and plan formulators. This task will cost $144,100.

Task JAAB Water Surface Profiles and Cross-Sections

Stream bed and water surface profiles and cross-sections will be developed in digital format for use in the hydraulic analysis. Survey data will be taken to establish cross sections and streambed and water surface profiles along the entire length of the project area. Cross sections will be taken at 500 foot intervals and both upstream and downstream of each bridge. Cross-sections will extend to top of high bank. This task will cost $88,500.

Major Task JAB Hydrology and Hydraulic Studies/Report

A report will be prepared that details the results of hydraulic and hydrologic (H&H) studies conducted during the feasibility study to characterize the study area and design and evaluate alternative plans. Activities to be documented in the H&H report include: development of input data; development, calibration and verification of hydrologic models; establishment of existing and future condition water surface profiles for various flow conditions; characterization of surface drainage patterns; model adjustment for future without project conditions; alternative screening; detailed analyses of several alternatives; risk and uncertainty analysis (as applicable); hydraulic design of alternatives; refinement of with project hydrologic engineering analysis; sediment assessment; activity estimate for PE&D phase; and preparation of the Hydraulics and Hydrology Appendix. This task also requires attendance at study team meetings and coordination with the local sponsor's hydrologic engineering staff. The Savannah District will:

- prepare a hydraulic design study plan for the feasibility phase, including a listing of data input needs, required studies, and an analysis of prior studies by others,
- perform a sediment engineering investigation of the drainage basin and channels (including channel stability analyses of pre-project and post-project conditions),
- develop hydraulic design of channel modifications (including channel dimensioning, bank protection, levee design, drop structure and grade stabilizer design, and junction design),
- provide flow/depth uncertainty relationships for conducting risk based analyses,
- determine induced flooding potential and need for hydraulic mitigation,
- provide input for interior flood analyses,
- produce hydraulic design plans and profiles for selected alternatives, and
- prepare a technical hydrology and hydraulics report suitable for incorporation as an appendix to the draft feasibility report.

Specific work activities will include:

- Review cross-sectional and topographic survey data for adequacy in developing the hydraulic model;

- Conduct field visits and collect high water marks necessary to calibrate the hydraulic model;

- Develop an hydraulic model for existing and also for future without project conditions (if different) for the 2-, 10-, 25-, 50-, 100-, and 500-year floods. The District will code, debug, and calibrate the model to known high water marks. Channel cross-sections will be provided at appropriate stream intervals and upstream and downstream of bridges and culverts known to be significant restrictions to channel flow;

- Lay out and compute existing water surface profiles and stage-frequency curves;

- Modify and run the hydraulic model for 4 improved conditions for each drainage basin. The District will perform bridge and culvert computations, analyze supercritical flow, conduct riprap analyses, and recalibrate the model for peak and coincidental flows;

- Identify selected alternatives for each drainage basin and conduct a detailed hydraulic analysis of three levels of protection in order to identify and select the NED plan;

- Generate improved flowlines, rating and stage-frequency curves for the selected plan;

- Plot the base profile and water surface profiles for the 2-, 10-, 25-, 50-, 100-, and 500-year floods under improved conditions;

- Prepare a technical appendix documenting the methodology and results of the hydraulic analysis. Major items to be included in the technical appendix are listed in ER 1110-2-1405, paragraph 6. Hydraulic data will be presented in a format suitable for developing quantities and costs.

All activities under this major task will be conducted by the Savannah District or its Contractor and will require 268 days and cost $145,500.

Major Task JAC Geotechnical Studies Report

A project wide analysis will be conducted at a general level of detail, based on geologic and soils information obtained through explorations and selected laboratory testing. Geotechnical engineering studies to be conducted include: site selection, stability, settlement, and under seepage, foundation design, material utilization, dewatering and diversion, and construction sequencing. All activities will be accomplished at a level of detail sufficient to meet the requirements of a baseline cost estimate. Activities conducted under this task will be accomplished by the Savannah District or its Contractor and will require 73 days and cost $34,800.

Major Task JAD Site Development Analysis/Report

This report is generally required only on major projects where the site cannot be selected based on an initial field inspection or evaluation of existing data, and will require additional field investigations and possibly more detailed hydraulic analysis. The need for additional site

development and analysis is not anticipated at this time. The cost of detailed hydraulic analyses is included under Major Task JAB – Hydrology and Hydraulic Studies/Report.

Major Task JAE Engineering and Design Analysis Report with Preliminary Drawings

This work will include preparing designs for all flood control and any potential fish and wildlife enhancement features. The basis of design will include drawings displaying the plan, profile, and typical cross sections. Quantities will be developed based on design sheets. The work will include field investigations and coordination with local interests regarding design considerations. This task will include determination of alternative operation and maintenance requirements. Details of the work will be discussed in a basis of design, which will be included as an appendix to the feasibility report. The level of detail of the design work will be sufficient to estimate the baseline cost, identify the NED plan, and determine the selected plan. More detailed design work may be included during the feasibility phase if the Corps and non-Federal sponsors determine and agree in advance that additional detail is warranted.

Task JAEA Preliminary Design

Preliminary designs will be prepared on approximately four project alternatives for each of the four canals. Preliminary concept level designs will be prepared at a level of detail sufficient to develop venture level cost estimates and aid in the screening of alternatives. The Savannah District's Engineering Division (or their Contractor) will perform this task. This task will require 16 days and cost $8,900.

Task JAEB Detailed Design

Detailed designs and preliminary drawings will be prepared for approximately 4 project alternatives and 3 plan scales per alternative. Designs and drawings will be developed at a feasibility level of detail. The likely range of alternatives to be designed are listed in Section I.E., Alternatives to be Considered in the Feasibility Study. The Savannah District's Engineering Division (or their Contractor) will perform this task. This task will require 57 days and cost $31,300.

Task JAEC Design Appendix

A design appendix to the feasibility report will be prepared. All design and drawings will be presented in a level of detail that will insure the integrity of the structure and/or system and meet the requirements of the baseline cost estimate. The Savannah District's Engineering Division (or their Contractor) will perform this task. This task will require 5 days and cost $3,200.

The total cost of all activities to complete Sub-Product JA - Engineering Appendix is $453,500.

Sub-Product JB Socioeconomic Studies/Report

Socioeconomic studies will be performed in compliance with the requirements of ER 1105-2-100. The purpose of socioeconomic studies are to assist in problem identification, characterize the

social and demographic characteristics of the affected populations, and to quantify benefits and costs of proposed solutions. Specifically, the socioeconomic studies will quantify and describe the impacts of alternative plans on the National Economic Development (NED) and Other Social Effects (OSE) Accounts. In addition, socioeconomic studies will include ability to pay analysis, financial analysis, analysis of local sponsors financing capability. A risk-based analyses will also be conducted, as required by ER 1105-2-101. The results of socio-economic studies will be presented in a Socio-Economic Appendix to the Feasibility Report. Summary results will be also be incorporated into the main body of the Feasibility Report and NEPA document.

Major Task JBA Economic Analysis/Report

Work conducted as part of the feasibility study effort will include obtaining floodplain maps and gathering and compiling property and structure characteristics such as first floor and low opening elevations, square footage, number of stories, usage, and type of construction for those structures located within the flood plains. Damage inventories will be conducted for all non-residential structures (i.e., commercial, industrial, and public structures) and vehicles subject to flood damage potential. Emergency and cleanup costs will also be estimated.

First floor elevations or other points of zero damage will be obtained for structures within the 500-year floodplain, with the use of topographic mapping. Approximately 10 variables will be taken for each structure in the floodplain. Inventory data shall be catalogued, compiled, and coded into database files.

Flood damages will be estimated for without project conditions, and flood damage reduction benefits for the various alternatives and the selected plan will be determined. Essential hydrologic and hydraulic input to the flood damage analysis includes without and with project condition stage-frequency data. Existing land use and future land use development projections will also be evaluated to determine whether potential damages will change under future conditions.

Once flood damages are estimated, the following benefit categories will be determined, as appropriate: inundation reduction benefits, location and intensification benefits, savings in flood proofing costs, advanced bridge and utility replacement, transportation cost savings, emergency cost savings, and employment benefits. Other potential benefits associated with incidental purposes will also be examined.

A risk based analysis will be conducted in accordance with ER 1105-2-101 to quantify uncertainties in the flood damage estimates, and a probability distribution will be developed for expected annual flood damages and flood reduction benefits associated with the various alternatives and the selected plan. Critical key variables that will be evaluated include first-floor elevations, structure values, and content values.

For each structural and non-structural alternative, NED costs and benefits will be identified and outputs and optimal plan size will be identified. All economic investigations conducted during the feasibility study will be documented, and a detailed economics appendix will be prepared by the Corps for inclusion in the feasibility report.

Work conducted under this sub account will be performed by the Economics and Special Programs Branch of the Savannah District Planning Division (or its Contractor). Activities conducted under this major task will require 120 days and cost $64,700.

Major Task JBB Social Studies/Report

The existing social, economic and demographic conditions of Chatham County and the specific project area (to the extent possible) will be documented for the Feasibility Report. The with and without project conditions will be defined and documented. The without project condition should reflect flood damage reduction projects which are likely to be constructed by others and other actions that may be taken in absence of a Federal project. Social impacts will be evaluated on the regions, communities and groups within the zone of influence of the project. Impacts to be considered under the OSE account will include: income distribution; employment distribution; population distribution and composition; the fiscal condition of the state and local governments; the quality of community life; life, health, and safety factors; displacement; long-term productivity; and energy requirements and energy conservation. Impacts to minorities and low income groups will also be evaluated and incorporated into the environmental justice analysis in the NEPA document. This task will be performed by the Savannah District's Planning Division (or its Contractor) and the non-Federal sponsor, will require 8 days and cost $4,600.

Major Task JBC Institutional Studies/Report

An investigation will be conducted to identify the jurisdictions, concerns, and authorities of the non-Federal sponsor and to determine the level of interest of agencies and organizations that may be involved in the study. The legal and institutional requirements for implementation of project features (including those to be implemented by the non-Federal sponsor) will also be identified. This task will be performed by the Savannah District's Planning Division (or its Contractor) and the non-Federal sponsor, will require 7 days and cost $4,000.

Major Task JBD Ability to Pay Report

An ability to pay analysis will be prepared in compliance with the requirements of ER 1105-2-100 and the provisions of WRDA 1986. The analysis will determined the local sponsor's eligibility to reduce their cost sharing responsibilities based local economic conditions. This task will be performed by the Savannah District's Planning Division and will require 2 days and cost $1,100.

Major Task JBE Financial Analysis Report

A financial analysis report will be prepared which consists of the non-Federal sponsor's statement of financial capability, their preliminary financing plan, and the District Commander's assessment of the non-Federal sponsor's financial capability. The financing plan will include: a current schedule of estimated Federal and non-Federal costs, by fiscal year; a schedule of the sources and uses of non-Federal funds during and after construction, by fiscal year; and the method of finance for all non-Federal outlays, including OMRR&R associated with the project. The non-Federal sponsor's statement of financial capability will include evidence of their authority and ability to obtain and commit the identified sources and uses of funds.

The non-Federal sponsor will prepare a Financing Plan that clearly and convincingly describes how it intends to meet its financial obligations for the project in accordance with the project funding and OMRR&R schedules. The financing plan will include a current schedule of estimated Federal and non-Federal expenditures by Federal fiscal year which will be provided by the Corps of Engineers and will exactly reflect cost sharing policy and should agree with estimated cost figures in the Feasibility Report. In addition, a schedule of the sources and uses of non-Federal funds during and after construction by Federal fiscal year should be included. The schedule should include project outlays and income as well as outlays and income related to project construction and financing. Also, the schedule of the sources and uses of funds should be consistent with the schedule of estimated Federal and non-Federal expenditures. Finally, the Financing Plan should explain the method of finance for all non-Federal outlays including OMRR&R associated with the project.

The Statement of Financial Capability is a clear and convincing description, submitted by the non-Federal sponsor, of its capability to meet its financial obligations for the project in accordance with the project funding schedule. This includes providing evidence of the non-Federal sponsor's authority to utilize the identified source or sources of funds; and each Statement of Financial Capability should provide information on the non-Federal sponsor's capability to obtain remaining funds, if any.

The District Commander's assessment of the non-Federal sponsor's financial capability will determine if it is reasonable to expect that ample funds will be available to satisfy the non-Federal sponsor's financial obligations for the project. Consideration should be given to prior performance of the non-Federal sponsor on similar projects, certainty of revenue sources and method of payment, and the overall financial position of the non-Federal sponsor. The assessment will demonstrate: 1) that the sponsor has adequate funds to meet its financial obligations as delineated by the project funding schedule provided by the Corps; 2) that the reliability of the sources of funds has been demonstrated; 3) that the sponsor has full and legal access to those funds; and 4) that all the parties providing funding essential to meeting the sponsor's financial obligation are legally committed to providing those funds.

Activities undertaken to complete the Financial Analysis Report will be conducted by the Savannah District (or its Contractor) and the non-Federal sponsor, and will require 15 days and cost $8,700.

The total cost of all activities to complete Sub-Product JB – Socio-Economic Studies/Report is $83,100.

Sub-Product JC Real Estate Analysis/Documents

All written real estate memoranda, opinions, reports and other documents will be prepared as required on a project-by-project basis.

Major Task JCA Real Estate Supplement/Plan

A Real Estate Supplement will be prepared as an appendix to the Feasibility Report that outlines the minimum real estate requirements for the proposed project, in accordance with ER 405-1-12, Draft Chapter 12. The Real Estate Supplement (RES) contains a description of the area; the acreage and proposed estates, including non-standard estates, and reasons therefore; a discussion of any land owned by the Federal government, the Local Sponsor or any public entity; an estimate of the Public Law 91-646 relocations; the Baseline Cost Estimate for Real Estate; a discussion of the Local Sponsor's ability to acquire Lands, Easements, Rights-of-Way, Relocations and Disposal area (LERRD); a discussion of mineral activity, if any, and the attitude of the landowner; a detailed schedule of land acquisition; a preliminary assessment of the facilities/utilities to be relocated; and any other relevant real estate information appropriate for the project. This task will be performed by the Savannah District's Real Estate Division and will require 28 days and cost $12,400.

Major Task JCB Gross Appraisal/Report

The Savannah District's Real Estate Division will evaluate the project area and conduct a Gross Appraisal. A detailed, supported appraisal of the collective real estate requirements and impact of the project, or selective portion thereof, including review and approval, will be performed as required by ER 405-1-12, (Chapter 4 and Draft Chapter 12) and policy guidance. Integral to this the work is the preparation of a Baseline Cost Estimate for Real Estate in M-CACES format and a Real Estate Supplement (RES). These items are required for inclusion in the final report.

Preparation of the Gross Appraisal will involve a detailed accounting of property ownership, property evaluation for possible easement rights or acquisition of impacted project lands, preparation of a Gross Appraisal, and assessment of project LERRD requirements. The final RES will be provided to Project Management and incorporated into the PMP. Real Estate representatives will also attend meetings and conferences with the sponsor when necessary. The Real Estate Division will also be involved in preparing, modifying and revising the Project Cooperation Agreement (PCA) in cooperation with the local sponsor, study manager, project manager, and all other affiliated or concerned agencies. This task will be performed by the Savannah District's Real Estate Division and will require 42 days and cost $22,300.

Major Task JCC Preliminary Real Estate Acquisition Maps

The Real Estate Division will prepare an initial set of maps and drawings that delineate the real estate acquisition lines based on technical design drawings developed by the Engineering Division during feasibility phase. Maps and drawings will reflect the minimum real estate required for project purposes. The cost of preparing the Real Estate acquisition maps was included under Major Task JCB.

Major Task JCD Physical Takings Analysis

A written legal opinion will be prepared as to whether flooding will be induced by the construction, operation or maintenance of the proposed project. If induced flooding is expected,

a determination will be made as to whether it will rise to the level of a taking of an interest in real property for which just compensation must be paid to the owner of the real property. The opinion will describe the analysis of relevant information regarding the depth, frequency, duration, velocity and extent of induced flooding, as well as relevant state and Federal law, and will present a conclusion on the physical taking issue. This task will be performed by the Savannah District's Real Estate Division and will require 15 days and cost $7,000.

Major Task JCE Preliminary Attorney's Opinion of Compensability

A preliminary legal opinion will be prepared on whether provision of a substitute facility is required under the Fifth Amendment as compensation for a facility/utility being acquired for the project. The opinion makes findings on whether the owner has a compensable interest, whether the owner has the legal duty to continue to maintain and operate the facility/utility, and whether Federal law requires the provision of a substitute facility/utility rather than a mere payment of the market value for the property acquired. The preliminary legal opinion differs from the final legal opinion only in its acceptance as fact of the owner's statement of interest in the property, without a search of property records. This task will be performed by the Savannah District's Real Estate Division and will require 15 days and cost $7,000.

Major Task JCF Rights of Entry

The District's Real Estate Division will obtain rights-of-entry as is necessary for various studies. Rights of entry will be obtained for purposes of environmental investigations, cultural assessments, core sampling, surveys, exploration, etc. Documentation will be prepared which provides evidence that permission from a landowner to temporarily use his/her land for a specific time and purpose was obtained. This task will be performed by the Savannah District's Real Estate Division and will require 22 days and cost $9,500.

The total of all activities to complete Sub-Product JC – Real Estate Analysis/Documents is $58,200.

Sub-Product JD Environmental Studies/Reports

Environmental studies will be performed in accordance with the National Environmental Policy Act (NEPA), ER 1105-2-100, ER 200-2-2, and other applicable laws, statutes, Executive Orders, and regulations. A NEPA document will be prepared to accompany the Feasibility Report. NEPA documentation will be coordinated with state and Federal environmental agencies and the public.

Major Task JDA Minutes of Scoping Meetings

A formal record will be made of discussions with the public and resource agencies that define the environmental concerns related to the evaluation of project alternatives and the selection of the recommended plan. This task will be performed by the Savannah District's Planning Division and will require 2 days and cost $1,300.

Major Task JDB Environmental Assessment (EA) and Finding Of No Significant Impact (FONSI)

A document will be prepared, as required by the National Environmental Policy Act of 1969 (NEPA), that evaluates the impacts of project alternatives on the human environment. An Environmental Assessment and Finding Of No Significant Impacts (FONSI) will be prepared, if appropriate. This task will be performed by the Savannah District's Planning Division (or its Contractor) and will require 47 days and cost $23,400.

Major Task JDC Environmental Impact Statement

If necessary, an EIS will be prepared for the Chatham County Regional Flood Control study.

Major Task JDD Coordination Documents with Other Agencies

Letters, meeting records, etc. will be prepared that document the correspondence and dialogue between agencies regarding the proposed project. This task will be performed by the Savannah District's Planning Division and will require 2 days and cost $1,300.

Major Task JDE Environmental Resource Inventory Report

An inventory will be prepared describing the natural resources that are located within the study area. This task will be performed by the Savannah District's Planning Division and will require 15 days and cost $8,700.

Major Task JDF Mitigation Analysis Report

A detailed evaluation will be conducted of possible actions that would offset unavoidable impacts associated with the proposed project. All efforts will be made to avoid and minimize environmental impacts of the proposed actions. However, if adverse environmental consequences cannot be avoided or minimized, a mitigation plan will be developed. This task will be performed by the Savannah District's Planning Division or its Contractor and will require 10 days and cost $6,000.

Major Task JDG Endangered Species Analysis

A comprehensive review will be conducted to assess the presence of threatened or endangered flora and fauna in the watershed as part of Major Task JDE. A report evaluating the potential effects of proposed projects on listed endangered/threatened species and proposed species and designated or critical habitat will be prepared and provided to the U.S. Fish and Wildlife Service for their use in their determining whether formal consultation or a conference is required. This task will be performed by the Savannah District's Planning Division (or its Contractor). The task will require 2 days and cost $1,100.

Major Task JDH Section 404(b)(1) Analysis Report

A report will be prepared as required by the Clean Water Act which presents an analysis of any water quality impacts associated with the placement of fill material in the waters of the United States. This task will be performed by the Savannah District's Planning Division (or its Contractor). The task will require 4 days and cost $2,300.

Major Task JDI 401 State Water Quality Certification

Certification will be obtained from the State of Georgia that proposed actions will not result in a violation of state water quality criteria. This task will be performed by the Savannah District's Planning Division (or its Contractor). The task will require 3 days and cost $1,700.

Major Task JDJ Record of Decision (ROD)

Because it is not anticipated that an EIS will be required for the Chatham County Regional Flood Control study, a ROD will not be prepared.

Major Task JDK Section 103 Evaluation

A Section 103 evaluation will not be required for the project.

Major Task JDL Statement of Findings (SOF)

A comprehensive summary of all environmental coordination and record of environmental compliance will prepared in conjunction with preparation of the EA and FONSI. This task will be performed by the Savannah District's Planning Division (or its Contractor). The task will require 7 days and cost $3,800.

Major Task JDM Coastal Zone Management Consistency Determination

A determination will be conducted to determine whether the proposed actions are consistent with the requirements of the State of Georgia's Coastal Zone Management Plan. This task will be performed by the Savannah District's Planning Division (or its Contractor). The task will require 3 days and cost $1,700.

Major Task JDN Other Environmental Documents

No other environmental studies or documents are anticipated at this time.

The total cost of all activities to complete Sub-Product JD – Environmental Studies/Report is $51,300.

Sub-Product JE Fish and Wildlife Coordination Act Report

This work product includes a report by the U.S. Fish and Wildlife Service (USFWS) to document the environmental studies required by the Fish and Wildlife Coordination Act. The principal

product of this task is a Coordination Act Report. The report will be prepared by the USFWS and will define the impacts of alternatives on fish and wildlife habitat and recommend types and amounts of mitigation for habitat losses. The Corps will coordinate with the USFWS and supervise the interagency contract as part of Sub-Product JE. The USFWS will participate in study scoping, identification of fish and wildlife concerns, identification of available information, determination of the significance of fish and wildlife resources, and quantification of anticipated impacts. The Coordination Act Report will be prepared by USFWS to accompany the Feasibility Report and NEPA document. Funding in the amount of $5,900 will be provided by the Corps of Engineers to the USFWS in accordance with the current Corps/USFWS Transfer Funding Agreement.

The total of all activities to complete Sub-Product JE – Fish and Wildlife Coordination Act Report is $5,900.

Sub-Product JF HTRW Studies /Report

HTRW investigations will be conducted in accordance with guidance provided in ER 1165-2-132. A report will be prepared which describes any hazardous/toxic/radiological waste (HTRW) occurrences within or nearby the project area. It will include a determination of the nature and extent of contamination and a qualitative analysis of the impacts of any contamination in the absence of response actions. It will also include a preliminary identification of potential source areas, contaminant release mechanisms, exposure routes, potentially exposed populations, as well as a determination of the non-numerical risk or potential adverse health effects for the identified potential receptors, and an evaluation of the environmental consequences of all storage, use generation, and disposal on the property.

Major Task JFA HTRW Preliminary Assessment Report

A report will be prepared describing existing and past land uses, based on a review of the historical records and other public documentation. Existing data sources will be evaluated to determine the potential presence of any HTRW. The evaluation will include the potential impact of known HTRW sites in the vicinity. In general, sites identified as having a potential for HTRW contamination will be excluded from consideration as project alternatives. This task will be performed by the Savannah District ’s Planning Division (or its Contractor). The task will require 10 days and cost $6,400.

Major Task JFB HTRW Site Inspection Report

Once alternative project sites are selected for detailed study, present and past maps, aerial photos, and community records for those sites will be reviewed; visual site surveys will be conducted; and land owners and knowledgeable individuals will be interviewed. If it is determined that there is no suspected HTRW problem, the investigation and findings to support this determination will be clearly indicated in the feasibility report. If it is determined that there is a potential HTRW site which would be disturbed by an alternative plan, regulatory agencies will be notified, and the alternative will be modified or dropped from consideration as a potential plan. The HTRW specialist will provide an account of the HTRW investigation and a map which identifies the

location of the known, reported, or suspected HTRW sites. This task will be performed by the Savannah District's Engineering Division (or its Contractor). The task will require 20 days and cost $17,700.

Major Task JFC HTRW Remedial Investigation Study/Report

Since prior studies did not identify HTRW contamination, and identified HTRW sites will be avoided, it is expected that a remedial investigation study/report will not be required.

The total of all activities to complete Sub-Product JF – HTRW Studies/Report is $24,100.

Sub-Product JG Cultural Resource Report

Section 106 of the Historic Preservation Act of 1966 requires Federal agencies or project sponsors seeking Federal funding and/or permits to conduct cultural resource surveys to locate, identify, and evaluate historic and prehistoric resources in advance of project approval. An evaluation of the impact of alternative plans on historic properties will be developed in consultation with the State Historical Preservation Officer (SHPO). A sampling survey strategy will be used and will provide for the efficient planning of any further cultural resource investigations that may be needed prior to initiation of construction. If considered necessary the sample survey may be waived in favor of an intensive survey/inventory during the Feasibility Phase.

Major Task JGA Site Survey Field Report

Cultural resource investigations will be conducted based on a research strategy tailored to ensure adequate coverage of the environmental zones within the alternative plan impact areas. The site survey field report will provide information on cultural resources necessary to assist in plan formulation and evaluation. A sampling strategy will be developed in consideration of the costs of the survey with respect to the number of viable alternative plans and the extent of the known area of potential effects. This major task will be performed by the Savannah District's Planning Division and its Contractor. The site survey field report will require $9,000 (15 days) of in-house labor and a $30,000 contract, for a total cost of $39,000.

Major Task JGB Data Collection and Analysis Report

This report is a brief description of the identified and predicted historic properties which would be impacted by the alternative plans that will be included in the Feasibility Report and NEPA document. Historic resource considerations that may influence the plan recommendations will be summarized and clearly set forth in the Feasibility Report. This major task will be performed by the Savannah District's Planning Division. This major task will require 15 days and cost $8,600.

Major Task JGC Mitigation Plan Report

The mitigation plan report will document the need for mitigating any adverse effects on historic properties listed or eligible for listing on the National Register of Historic Places, and will include plans and cost estimates for mitigation or other treatment of historic properties affected by the

project. This major task will be performed by the Savannah District's Planning Division. This major task will require 10 days and cost $5,700.

Major Task JGD Memorandum of Agreement

If the identification of historic properties and project impacts cannot be accomplished in a timely manner for consideration in a NEPA document or Feasibility Report, a Memorandum of Agreement (MOA) can be developed between the District, the State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation, and other consulting parties to specify the processes by which required surveys, testing, evaluation effects determination, mitigation planning, and coordination will be achieved. It is not expected that this task will be required.

Major Task JGE One Percent Waiver

If mitigation costs are expected to exceed one percent of the total estimated Federal appropriation required for construction of a project and Congress has not specifically authorized expenditures in excess of this amount, a waiver request in the form of a letter report submitted through channels to HQUSACE should be prepared. The waiver must then be submitted to the Secretary of the Interior, through the Department Consulting Archaeologist, for concurrence and Congressional notification. It is not expected that a one percent waiver will be required for this project.

The total of all activities to complete Sub-Product JG – Cultural Resource Report is $53,300.

Sub- Product JH Cost Estimates

This activity includes all deliverables required to prepare life cycle project cost estimates needed to support the Feasibility Report, and to prepare the baseline project cost estimate. Cost estimates will be developed in accordance with the guidance contained in ER 1110-2-1302, *Civil Works Cost Engineering*, using the M-CACES cost estimating system. Cost estimates will be presented in the Civil Works Breakdown Structure (CWBS) format. Cost estimates will include both Federal and non-Federal costs for construction, real estate, engineering and design, construction management, environmental, cultural resources and HTRW investigations and remediation, operation and maintenance, replacement, repairs and rehabilitation of alternatives and the recommended project. Revisions to the estimates prepared for the draft report and comparative cost estimates used for alternative analysis will also be included. In addition, this product will include an estimate of the cost of the preparation of cost estimate updates during the Preconstruction Engineering and Design (PE&D) phase.

Major Task JHA Study Cost Estimate Updates

This activity includes all deliverables related to the preparation of and revisions to the Feasibility Study Cost Estimate. This activity was completed during the reconnaissance phase of the study and no updates are required.

Major Task JHB PE&D Cost Estimate

The PE&D cost estimate will be prepared and revised, as necessary, to accompany the Feasibility Report and PMP. The PE&D cost estimate will include all Federal costs for preconstruction, engineering and design from the date of the Division Commander's Notice to the award of the first Federal construction contract. This task will be coordinated by the Savannah District's Engineering Division, with input from each District element responsible for a portion of the PE&D investigations (costs for preparation of individual elements of the PE&D estimates are included in the Feasibility Study cost estimates for each technical discipline). The task will require 5 days and cost $2,700.

Major Task JHC Project Cost Estimate

Project cost estimates will be prepared using a phased approach. Preliminary, reconnaissance level cost estimates will be prepared for approximately four alternatives for each of the four canals (16 total) to support to plan formulation and screening of alternatives. Comparative cost estimating techniques will be used to support alternative screening and preliminary benefit-cost analyses.

Detailed feasibility level cost estimates will be prepared for the final set of four selected alternatives. Detailed cost estimates will be prepared in M-CACES and will be documented with notes to explain the assumed construction methods, crews, productivities, sources of materials, and other specific information. Labor costs will be based on the prevailing Davis-Bacon wage rates for each trade. Equipment costs will be based on EP 1110-1-8, *Construction Equipment Ownership and Operation Expense Schedule.* Contingencies will be developed and applied where areas of uncertainty exist. Detailed costs for all of the non-construction cost items (lands and damages, construction management, PE&D) will be provided by the appropriate District offices and incorporated into the estimate.

The Cost Engineering Appendix will include a written description of the methodology used in the development of the baseline cost estimate. The appendix will also include a description of the scope of the projects included in the estimate and a description of the potential risk associated with the estimate. Estimates will include both Federal and non-Federal costs for construction, real estate, engineering and design, cultural resources, construction management, HTRW investigations and remediation of potential project impacts. The preliminary, comparative costs estimates that were used for alternative screening and benefit-cost analyses will also be included in the Appendix. This task will be performed by the Savannah District's Engineering Division (or its Contractor). All activities conducted under this task will require 97 days and cost $52,300.

Major Task JHD OMRR&R Cost Estimate

This activity includes all deliverables related to the preparation of the OMRR&R cost estimates. The preliminary, comparative cost estimates that were used for alternative screening and benefit-cost analyses will also be included. This task will be performed by the Savannah District's Engineering Division (or its Contractor). The task will require 5 days and cost $2,700.

Major Task JHE Baseline Fully Funded Cost Estimate

The fully funded cost estimate will be prepared based on the project cost estimate developed in Task JHC – Project Cost Estimate. The project cost estimate will be updated, revised, and escalated for inflation through completion of the project. The fully funded cost estimate will be used to support the Project Management Plan (PMP) and upward reporting requirements. This task will be performed by the Savannah District's Engineering Division (or its Contractor). The task will require 10 days and cost $5,400.

The total of all activities to complete Sub- Product JH - Cost Estimates is $63,100.

Sub-Product JI Public Involvement Documents

Work under this sub-product will be performed by the Savannah District's Planning Division and the non-Federal sponsor. Public involvement activities will include public meetings/workshops and agency meetings held during the feasibility study, plus other miscellaneous meetings with local officials. Coordination with state and local agencies will be initiated immediately and will be maintained throughout the study process.

Public involvement includes interagency coordination between the Savannah District; Federal and Georgia resource management agencies; the proposed local sponsor, Chatham County; environmental and community groups; and other interested parties. Project scoping and status meetings will be held with the local sponsor. Meetings will be held to discuss data collection needs, study area water resource problems, and flood damage reduction alternatives with various organizations. Newsletters, fact sheets and/or individually written letters will be generated to keep interested parties updated on the status of the feasibility study. The District will provide the local sponsor with minutes of meetings and forward appropriate information regarding the project schedule. Coordination will also be maintained with the U.S. Fish and Wildlife Service (USFWS) and the U.S. Environmental Protection Agency (USEPA).

Major Task JIA Notices and Public Meeting(s)

Letters, notices, newspaper articles, and radio announcements will be used to inform the public of meetings, workshops and hearings. Meetings will be held at appropriate locations within the project area to inform the public and obtain input to the plan formulation and decision making process. This task will be performed by the Savannah District's Planning Division (or its Contractor) and the non-Federal sponsor. The task will require 16 days and cost $10,600.

Major Task JIB Minutes of Public Meeting(s)

Verbal record and written transcripts of public meeting(s) will be developed and maintained on file at the Savannah District. This task will be performed by the Savannah District's Planning Division (or its Contractor) and the non-Federal sponsor. The task will require 4 days and cost $1,600.

Major Task JIC Public Comments Report

A brief summary of the comments received during and after public meetings and workshops will be prepared and kept on file at the Savannah District. This task will be performed by the Savannah District's Planning Division (or its Contractor) and the non-Federal sponsor. The task will require 7 days and cost $3,300.

Major Task JIE Other Public Involvement Documents

The results of the public involvement program will be documented in a Public and Agency Coordination Appendix to the Feasibility Report. The Appendix will document public involvement activities performed during the feasibility phase. Other public involvement work tasks will include responding to inquiries from the general public, agencies and Congressional interests; coordination with the media; briefings for various committees and private organizations; and preparing materials, including visual aids, for meetings. This task will be performed by the Savannah District's Planning Division (or its Contractor) and the non-Federal sponsor. The task will require 13 days and cost $7,400.

The total of all activities to complete Sub-Product JI - Public Involvement Documents is $22,900.

Sub-Product JJ Plan Formulation and Evaluation Report

The feasibility study will follow the six step planning process specified in ER 1105-2-100. Steps in the plan formulation process will include:

1. The specific problems and opportunities that will be addressed in the study will be identified, and the causes of the problems will be discussed and documented. Planning goals will be set, objectives will be established, and constraints will be identified.

2. Existing and future without project conditions will be identified, analyzed and forecast. The existing condition of resources, problems and opportunities critical to plan formulation, impact assessment, and evaluation will be characterized and documented.

3. The study team will formulate alternative plans that address the planning objectives. An initial set of alternatives will be developed for each canal and will evaluated at a preliminary level of detail. One alternative plan will be selected for each canal and three levels of protection for the final set of alternatives will be developed in order to bracket the NED plan. Non-structural plans for watershed management considered essential to the success of flood damage reduction efforts (e.g., stormwater management) will be identified and formulated.

4. Alternative project plans will be evaluated for effectiveness, efficiency, completeness and acceptability. The impacts of alternative plans will be evaluated using the system of accounts framework (NED, EQ, RED, OSE) specified in the Principles and Guidelines and ER 1105-2-100.

5. Alternative plans will be compared. A benefit-cost analysis will be conducted to prioritize and rank alternatives. The public involvement program will be used to obtain public input to the alternative evaluation process.

6. A plan will be selected for recommendation and a justification for plan selection will be prepared.

The following tasks will be completed by the Planning Division study manager and the non-Federal sponsor's study coordinator. The costs of participation in plan formulation activities by the rest of the study team are included in their technical study estimates under the appropriate Sub-Products.

Major Task JJA District Coordination Meeting

A meeting will be held with all study team members, including the non-Federal sponsor, shortly after the initiation of the feasibility phase. The purpose of the meeting will be to plan and coordinate activities between the different technical disciplines responsible for performing portions of the feasibility study investigations. This task will be coordinated by the Savannah District's Planning Division and the non-Federal sponsor. The task will require 10 days and cost $6,400.

Major Task JJB Establish Without Project Conditions

Without project conditions will be developed and refined in the early stages of the Feasibility Study based on environmental, hydrologic, institutional and socioeconomic input. This task will be performed by the Savannah District's Planning Division (or its Contractor) and the non-Federal sponsor. The task will require 10 days and cost $5,700.

Major Task JJC Preliminary Formulation and Screening of Alternatives

The study manager will lead the study team in identifying and screening alternative projects. Based on review of existing data and limited field reconnaissance, the study team will identify potential alternatives, develop concept level designs and venture level cost estimates, and conduct a preliminary benefit-cost analysis of alternatives. This information, plus information obtained from the public, will be used to screen alternatives to the final set which will be subject to detailed evaluation. The preliminary set of formulated plans may include required alternatives such as a no-action plan and a nonstructural plan, as well as structural measures to reduce flood damages. The preliminary formulation of alternatives task will be performed by the Savannah District's Planning Division (or its Contractor) and the non-Federal sponsor. The task will require 16 days and cost $9,700.

Major Task JJD Detailed Evaluation

The final set of formulated plans will be formulated from a variety of flood control measures to display a full array of flood control opportunities, assess their performance under various flood events, identify a reliable NED plan, and satisfy NEPA. As part of the formulation process, the study will consider technical feasibility, economic feasibility, environmental impact, real estate acquisition, induced flooding, and views of the public. The alternatives that pass the initial

screening process described in Major Task JJC will be analyzed in terms of costs and benefits to determine an NED plan.

Alternatives will be evaluated in a risk-based framework. The procedures specified in ER 1105-2-101, Planning – Risk Based Analysis for Evaluation of Hydrology/Hydraulics, Geotechnical Stability, and Economics in Flood Damage Reduction Studies, 1 March 1996, U.S. Army Corps of Engineers, will be used to evaluate the inherent hydrologic, hydraulic, and economic uncertainties and express the reliability of alternatives in terms of percent chance of failure for given flood events. Three levels of protection will be analyzed for each of the selected plans for the four drainage areas in order to bracket the NED plan. Locally preferred plans will also be evaluated, if different from the NED plan.

The detailed evaluation of alternatives will be performed by the Savannah District's Planning Division (or its Contractor) and the non-Federal sponsor. The task will require 30 days and cost $17,200.

Major Task JJE Plan Formulation Management and Report

A study manager will be assigned from the District's Planning Division to lead the plan formulation effort. The non-Federal sponsor will also assign a study coordinator to work with the Corps study manager and coordinate non-Federal in-kind services. The planning study manager and non-Federal study coordinator will lead the study team and coordinate the plan formulation process. Management of the plan formulation effort will include such activities as planning team meetings, upward reporting, preparation of study management documents, coordination with the local sponsor and other agencies, and integration of all technical investigations.

The study manager will summarize the results of the technical studies leading to plan selection in the Plan Formulation Report. The Plan Formulation Report will document the alternative formulation, evaluation and selection process that was used to identify the NED plan and the tentatively selected plan. The costs and benefits and environmental and hydraulic impacts of alternatives presented in the report will be developed at the feasibility level of detail, although the detailed, technical appendices will not be prepared by this time.

The annual and periodic activities and responsibilities for operating and maintaining the completed project will be described in the Plan Formulation Report, including environmental mitigation sites if required. The magnitude of these activities will be described for the alternative recommended for implementation. All requirements of 33 CFR 208 and other Federal regulations specifying operation and maintenance requirements will be clearly described so that Chatham County will be aware of its future O&M responsibilities.

Management of the plan formulation process and preparation of the Plan Formulation Report will be performed by the Savannah District's Planning Division (or its Contractor) and the non-Federal sponsor. This task will require 90 days and cost $50,600.

The total of all activities to complete Sub-Product JJ - Plan Formulation and Evaluation Report is $89,600.

Sub-Product JQ Alternative Formulation Briefing

A checkpoint conference will be scheduled midway through the formulation effort, to insure that the Corps and the non-Federal sponsor focus their resources on alternatives that are in the Federal interest. The checkpoint conference will take the form of an Alternative Formulation Briefing (AFB), in accordance with Planning Guidance Letter (PGL) 98-05, Appendix O to ER 1105-2-100 (Revised).

The Alternative Formulation Briefing will be attended by the Savannah District, the non-Federal sponsor, the South Atlantic Division, and HQUSACE. The purpose of the AFB is to review study findings concerning flood damage reduction problems and needs; to evaluate the array of alternatives and determine their consistency with the Federal interest; and to review the preliminary analysis of the impacts of alternatives. This meeting will be a key decision point in determining whether alternatives meet Federal and non-Federal policies and budgetary criteria and should be recommended for project implementation. If the non-Federal sponsor has a preferred alternative which differs from the Federally recommended plan, it will be identified and reviewed at this time.

The AFB will be scheduled after the plan formulation, economics and engineering analyses are completed and the District has selected the NED plan.

Major Task JQA AFB Project Documentation

Background material in the form of the Alternative Formulation Report will be sent to SAD at least two (2) weeks prior to the conference. Without-project condition hydrology must be approved by the Division prior to the conference. The designs and costs presented at the AFB will be at a preliminary level of detail sufficient to screen alternatives and select the plans which will be subject to a detailed analysis. The total level of effort to conduct all activities under this major task is 17 person-days and will cost $12,900.

Major Task JQB AFB Technical Review Documents

Technical review documents will be prepared by the Savannah District. This task will be performed by SAS.

Major Task JQC AFB Policy Compliance Review Documents

Policy compliance review documents will be prepared by HQUSACE. This task will be performed by HQUSACE and will be funded through GE appropriations.

Major Task JQD AFB Guidance Memorandum

An AFB Guidance Memorandum will be prepared by HQUSACE documenting directions provided to the Savannah District for completion of the feasibility study. This task will be performed by HQUSACE and will be funded through GE appropriations.

The total of all activities to complete Sub-Product JQ – Alternative Formulation Briefing is $12,900.

Sub-Product JK Draft Report Documentation

A draft Feasibility Report will be prepared following the guidance contained in ER 1105-2-100. With minor revisions, the plan formulation report will be suitable for incorporation into the Feasibility Report as the main report section. Detailed appendices will be prepared that document the results of the technical analyses. The cost of preparing report appendices are contained under each of the technical elements described previously. The contents of the Draft Feasibility Report are summarized below:

1. Concise main report summarizing the study's technical findings, conclusions and recommendations;

2. A draft NEPA document;

3. Technical appendices presenting the detailed backup and results of individual work tasks;

4. An appendix containing the sponsor's financial capability statement and preliminary financing plan; and

5. Other supporting documentation including the Project Management Plan (PMP).

Major Task JKA Draft Feasibility Report and NEPA Document

Preparation of the Draft Feasibility Report includes assembling, writing, editing, typing, drafting, reviewing, reproducing and distributing the Draft Feasibility Report, Draft NEPA document and other related documentation required for transmittal to USACE and higher authorities for use as a decision document. The Draft Feasibility Report and Draft NEPA document will be prepared by the District's Planning Division. The costs of preparing the Draft NEPA document and are included under other Sub-Products. Preparation of the Draft Feasibility Report will be performed by the Savannah District's Planning Division (or its Contractor). This task will require 57 days and cost $28,800.

Major Task JKB Public Review Comments

This task involves reviewing and preparing responses to letters received from agencies and the public in response to the Draft Feasibility Report and Draft NEPA document. Responses to the comments will be included in the Final Feasibility Report and Final NEPA document. This task will be performed by the Savannah District's Planning Division (or its Contractor). This task will require 7 days and cost $3,300.

Major Task JKC Project Guidance Memorandum (PGM)

This task includes directive guidance prepared by HQUSACE for the work to be accomplished to obtain approval of the Final Feasibility Report. This task will be performed by HQUSACE and will be funded through GE appropriations.

Major Task JKD All Other Draft Feasibility Report Documents

No other draft feasibility report documents are anticipated.

Major Task JKE Technical Review Documents

Technical review documents will be prepared by Savannah District.

Major Task JKF Policy Compliance Review Documents

Policy compliance review documents will be prepared by HQUSACE. This task will be funded through GE appropriations.

The total of all activities to Sub-Product JK - Draft Report Documentation is $32,100.

Sub-Product JL Final Report Documentation

The Final Feasibility Report will incorporate comments from agencies, the public and higher authority review. The steps in producing a Final Feasibility Report include the following:

1. finalize Draft Feasibility Report for internal/sponsor review;
2. conduct review board meetings;
3. revise the Draft Feasibility Report in response to SAD and HQUSACE comments;
4. modify the Draft Feasibility Report in response to comments received during the agency and public comment period;
5. coordinate with the non-Federal sponsor and internal District elements; and
6. reproduce and distribute the Final Feasibility Report.

Major Task JLA Division Commanders Notice

A public notice will be prepared to announce the completion of the Division Commander's Report, based on his endorsement of the findings and recommendations of the District Commander. The public notice will indicate that the report has been submitted for Washington Level Review. This task will be performed by the South Atlantic Division and will be funded through GE appropriations.

Major Task JLB All Other Final Feasibility Report Documents

No other final feasibility report documents are anticipated.

Major Task JLC Final Feasibility Report and NEPA Document

The Final Feasibility Report and final NEPA document will be prepared by the Savannah District's Planning Division. The costs of preparing the Final NEPA document and the technical appendices are included under other Sub-Products. Preparation of the Final Feasibility Report will be performed by the Savannah District's Planning Division (or its Contractor). This task will require 30 days and cost $16,300.

The total cost of all activities to complete Sub-Product JL – Final Report Documentation is $16,300.

Sub-Product JM Washington Level Report Approval

This Sub-Product includes all activities necessary for submittal of the Final Feasibility Report to Congress after completion of all levels of review. To ensure that the non-Federal sponsor is afforded an opportunity to participate in any significant effort as a result of Washington level review, funding for the District and the non-Federal sponsor are included as a separate work item in this Sub-Product. These costs, including any necessary travel, will be limited to those reasonable costs associated with the review and processing of the Feasibility Report. In accordance with EC 1105-2-108, this item will be 5 percent of the total study cost or $50,000, whichever is less, and will be cost shared equally between the Corps of Engineers and the non-Federal sponsor. Since the total study cost is in excess of $1 million, $50,000 has been allocated to this task.

Major Task JMA Policy Compliance Review Documents

A written assessment of the final Feasibility Report will be prepared by HQUSACE, Civil Works Directorate, Policy Division, to document the Feasibility Report's compliance with current policy. This task will be funded through GE appropriations.

Major Task JMB Chief of Engineers' Report

A brief summary of the Feasibility Report, signed by the Chief of Engineers, will be prepared to transmit recommendations to the Assistant Secretary of the Army for Civil Works (ASA(CW)). This task will be performed by HQUSACE and will be funded through GE appropriations.

Major Task JMC OMB Letter to ASA(CW)

A letter will be prepared from OMB to ASA(CW) expressing the Administration's position regarding transmitting the report to Congress for authorization. This task will be performed by OMB and will be funded through other appropriations.

Major Task JMD ASA(CW) Transmittal to Congress

A letter will be prepared from ASA(CW) transmitting the Feasibility Report along with ASA(CW)'s recommendation to Congress. This task will be performed by ASA(CW) and will be funded through other appropriations.

Major Task JME State & Agency Review and NEPA Document Filing Letters

Letters from appropriate State and Federal regulatory agencies will be obtained by the Savannah District and included in the final NEPA document.

The total cost of all activities to complete Sub-Product JM - Washington Level Report Approval is $50,000.

Sub-Product JN All Other Feasibility Studies/Investigations

No additional feasibility studies/investigations will be required.

Sub-Product JO Damages Assessed AE Contractors

Documents that determine and assess the liability for inadequate A-E efforts will be prepared, if required.

Sub-Product JP Management Documents

This Sub-Product includes all of the documents related to the management of the Feasibility Report, including A-E contract administration and in-house control.

Major Task JPA A-E Contract Documents

This activity includes preparation of negotiation, award and contract administration documents for the utilization of A-E Contractors to complete, or assist in the completion of, Feasibility Phase products. The cost of obtaining A-E services are included in the study cost estimates of the technical study sub-products.

Major Task JPB Coordination Documents

Included under this major task are: copies of letters exchanged with the local sponsor that affect study costs, scopes and/or schedules; official correspondence with higher authority on similar subjects; internal memoranda which bear on significant study elements and, in general, any other correspondence which affects significant aspects of the study. This task will be performed by the Savannah District's Project and Programs Management Division (PPMD). This task will require 11 days and cost $6,600.

Major Task JPC Study Funds Control Documents

This task includes preparation and management of internal funds control documents for the allocation and management of the Feasibility Study. The Savannah District's Project and Programs Management Division (PPMD) project manager (PM) is responsible for managing the overall study cost, schedule, preparing present and future budget year submissions, and conducting fiscal coordination with the non-Federal sponsor. A representative of the non-Federal

sponsor will assist in project management. The Savannah District PM, with assistance by the non-Federal sponsor's project manager, will: monitor expenditures, keep the IPMP current, prepare project management reports, and report study status and issues to the District Engineer and the Executive Committee. The project management structure will continue into the PE&D phase. Updates of IPMP will include monthly finance and accounting reports regarding expenditures and obligations, executive summary reports for the PRB, schedule and cost changes, and changes to work elements.

This task includes preparation of budget documents and financial reports. At the end of the study a final audit will be performed. Work required to prepare a sponsor letter of intent to participate in the Preconstruction Engineering & Design and construction phases will be also be prepared under this task. This task will be performed by the Savannah District's Project and Programs Management Division (PPMD). This task will require 11 days and cost $6,400.

Major Task JPD Trip Reports

Written trip reports will be prepared that document study area visits, meetings with the non-Federal sponsor, and other trips that affect the scope, cost or schedule of the Feasibility Report or the project. The cost of preparing trip reports is included under Major Task JJE – Plan Formulation Management and Report.

Major Task JPE Minutes of Technical Review Conference (TRC)

Minutes will be prepared on the results of the TRC. Comments received on the technical aspects of the Feasibility Report as reviewed concurrently at a Technical Review Conference with the District, MSC, and HQUSACE will be documented and responses prepared. The cost of preparing the TRC minutes are included under Sub-Product JJ – Plan Formulation and Evaluation Report. The cost of PPMD participation in the TRC and in the preparation of the minutes and responses will require 2 days and $1,300.

Major Task JPF All Other Management Documents

This task includes all other appropriate management documents determined to be needed on a case by case basis. No additional management documents are anticipated.

The total cost of all activities to complete Sub-Product JP – Management Documents is $14,300.

Product K Project Cooperation Agreement (PCA)

The Project Cooperation Agreement (PCA) documents the cost sharing aspects, relative roles and responsibilities for the project, and contains an analysis of the local sponsor's ability to meet their responsibilities under the terms of the PCA.

Sub-Product KA Initial Draft PCA Package

The Initial Draft PCA Package will accompany the Feasibility Report and will include: (1) the applicable model PCA for a flood damage reduction project (see ER 1105-1-100 and ER 1165-2-131); (2) Federal non-Federal allocation of funds table; (3) PCA deviation report; (4) certification of legal review; and (5) MSC review comments.

Major Task KAA Initial Draft PCA

A draft Project Cooperation Agreement (PCA) will be included in the Feasibility Report. The PCA is a legally binding agreement the sets forth the terms and conditions of the relationship between the Federal government and the non-Federal sponsor for construction, operation and maintenance of projects approved through the feasibility process. This task will be performed by the Savannah District's Project and Programs Management Division (PPMD). This task will require 17 days and cost $8,800.

Major Task KAB Federal/Non-Federal Allocation of Funds Table

An allocation of funds table will be prepared that includes the allocation of funds for each feature, programmed by FY, for the non-Federal sponsor and Federal government. This table outlines the cash flow for each partner for project purposes (see ER 1165-2-131, ER 11-2-240, and appropriate Project Management guidance letters). This task will be performed by the Savannah District's Project and Programs Management Division (PPMD). This task will require 2 days and cost $1,100.

Major Task KAC PCA-Deviation Report

The Deviation Report outlines, point-by-point, the deviations of the PCA from the standard model PCA. This report is intended to assist higher level authorities in their review of the PCA. The Deviation Report will be an attachment to the letter forwarding the draft PCA package to HQUSACE. This task will be performed by the Savannah District's Project and Programs Management Division (PPMD). This task will require 2 days and cost $1,100.

Major Task KAD PCA-Certification of Legal Review

A brief memorandum for record will be prepared that certifies that the District Counsel has reviewed the initial draft PCA for legal sufficiency. This task will be performed by the Savannah District's Office of Counsel. This task will require 2 days and cost $1,100.

Major Task KAE PCA-Checklist

An endorsement will be attached to the Draft PCA that contains the SAD review comments on the PCA. This task will be performed by SAD and funded through other appropriations.

The total cost of all activities to complete Sub-Product KA – Initial Draft PCA package, is $12,100.

C. Reference to Statutes, Regulations, and Guidance

This section of the PSP lists statutes, regulations, Corps guidance, and other source materials that will be referred to during the feasibility study to guide completion of feasibility study tasks. The table below provides a summary of the acronyms and subject matter of various types of guidance. This table was extracted from the U.S. Army Corps of Engineers, Institute for Water Resources, IWR Report 95-R-15, Draft Planning Manual, December 1995, which is also a useful reference document in providing practical suggestions for conducting water resource planning studies.

AR	Army Regulation
EC	Engineering Circular
EM	Engineering Manual
EP	Engineering Pamphlet
OM	Office Memorandum
PGL	Planning Guidance Letter
TL	Technical Letter
1105	Planning
1110	Engineering
1120	Construction – Operations
1130	Construction – Operations
1140	Construction – Operations
1165	Policy

The principal engineering regulation (ER) which guides the Corps of Engineers planning process is ER 1105-2-100, Guidance for Conducting Civil Works Planning Studies, 28 December 1990, U.S. Army Corps of Engineers. Appendix A of ER 1105-2-100 contains references to the applicable statutes, public laws, executive orders, and engineering regulations which guide preparation of Corps feasibility studies that had been promulgated as of the time of the ER (December 1990).

Additional references that will be utilized during the completion of work tasks include the following:

CEAO-I Memorandum, dated 10 August 1988, subject: HQUSACE Internal Review Guides - Compliance with Feasibility Study Guidance.

CECW-A Policy Memorandum, Implementation of New Technical and Policy Review Procedures, 14 April 95, U.S. Army Corps of Engineers

CECW-A Policy Memorandum No. 2, Civil Works Decision Document Review - Review Compliance, 6 April 95, U.S. Army Corps of Engineers

CECW-PM, Planning Guidance Letter 97-1, WRDA 96 Implementation, 19 November 1996, U.S. Army Corps of Engineers

CECW-PE, Planning Guidance Letter 97-10, Shortening the Planning Process, 26 March 1997, U.S. Army Corps of Engineers

CECW-PE, Memorandum, Model Agreement for Feasibility Studies, 21 March 1997, U.S. Army Corps of Engineers

EC 1105-2-208, Preparation and Use of Project Study Plans, 23 December 1994, U.S. Army Corps of Engineers

EM 1110-1-1005, Topographic Surveying, 31 August 1994, U.S. Army Corps of Engineers

EM 1110-1-1802, Geophysical Exploration for Engineering and Environmental Investigations, 31 August 1995, U.S. Army Corps of Engineers

EM 1110-2-1415, Hydrologic Frequency Analysis, 05 March 1993, U.S. Army Corps of Engineers

EM 1110-2-1416, River Hydraulics, 15 October 1993, U.S. Army Corps of Engineers

EP 11-1-4, Value Engineering: A Profitable Partnership, 15 May 1995, U.S. Army Corps of Engineers

EP 715-1-4, Architect-Engineer Contracts, 8 June 1994, U.S. Army Corps of Engineers

EP 1110-2-9, Hydrologic Engineering Study Design, 31 July 1994, U.S. Army Corps of Engineers

ER 5-7-1, Project Management System, 1 March 1991, U.S. Army Corps of Engineers

ER 220-2-2, Procedures for Implementing NEPA, (33 CFR 230), 4 March 1988, U.S. Army Corps of Engineers

ER 405-1-12 (Chapter 12), Real Estate Handbook - Local Cooperation, 28 May 1991, U.S. Army Corps of Engineers

ER 715-1-16, Selection of Architect-Engineer Firms, 3 March 1995, U.S. Army Corps of Engineers

ER 1105-2-101, Planning – Risk Based Analysis for Evaluation of Hydrology/Hydraulics, Geotechnical Stability, and Economics in Flood Damage Reduction Studies, 1 March 1996, U.S. Army Corps of Engineers

ER 1110-1-12, E&D Quality Management, 1 June 1993, U.S. Army Corps of Engineers

ER 1110-1-1003, NAVSTAR Global Positioning System Surveying, 31 December 1994, U.S. Army Corps of Engineers

ER 1110-1-1300, Cost Engineering Policy and General Requirements, 26 March 1993, U.S. Army Corps of Engineers

ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 March 1994, U.S. Army Corps of Engineers

ER 1110-2-1302, Civil Works Cost Engineering, ENG 1738-R, ENG 1739-R, ENG 1740-R, ENG 1741-R, ENG 1741A-R, , ENG 1741B-R, ENG 1741C-R, 31 March 1994, U.S. Army Corps of Engineers

ER 1110-2-1450, Hydrologic Frequency Estimates, 31 August 1994, U.S. Army Corps of Engineers

ER 1110-2-1460, Hydrologic Engineering Management, 7 July 1989, U.S. Army Corps of Engineers

ER 1110-2-1464, Hydrologic Analysis of Watershed Runoff, 30 June 1994, U.S. Army Corps of Engineers

ER 1110-2-8153, Technical Project Sedimentation Investigations, 30 September 1995, U.S. Army Corps of Engineers

EP 1165-2-1, Digest of Water Resource Policies and Authorities, 15 February, 1996 (updated annually), U.S. Army Corps of Engineers

ER 1165-2-131, Local Cooperation Agreements for New Start Construction Projects, 15 April 1989, U.S. Army Corps of Engineers

ER 1165-2-132, Hazardous, Toxic and Radioactive Waste (HTRW) Guidance for Civil Works Projects, 26 June 1992, U.S. Army Corps of Engineers

Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies, 10 March 1983, U.S. Water Resources Council

III. Work Breakdown Structure (WBS)

The Work Breakdown Structure (WBS) is a product-oriented hierarchy of the scope of work, and is broken down into component products and sub-products. The WBS presented below follows the definition of major tasks, tasks, and subtasks defined in the Scope of Studies (SOS). The WBS is intended to summarize the entire feasibility work effort and is an outline of the specific tasks that are to be accomplished to produce the feasibility study products. The WBS follows a consistent set of accounting codes. The accounting codes of the WBS are intended to allow products, tasks, cost, and schedule to be tracked with easy reference throughout the feasibility phase.

The Civil Works Breakdown Structure used here is an accounting system for Corps of Engineers Civil Works projects. The Corps of Engineers Financial Management System (CEFMS) and the Project Management Information System (PROMIS) were designed to directly accept cost data for projects established using the Civil Works Breakdown Structure. Once these management systems go on line, no funds can be spent without a study budget based on the Civil Works Breakdown Structure. Other new Corps applications are expected to require the use of the Civil Works Breakdown structure as well. Therefore, in anticipation of the requirements of these systems, we have adopted the accounting system of the Civil Works Breakdown Structure for the WBS. Table III-1 lists the accounting codes of the Civil Works Breakdown Structure for this feasibility study. The alphabetic code J corresponds to (and links) all work efforts related to preparing the feasibility report to the Feasibility Report product. The second level (e.g., JA - Engineering Appendix) corresponds to sub-products of the feasibility report. The third level (e.g., JCB - Gross Appraisal Report) corresponds to major tasks/work elements. Tasks (4th level), sub-tasks (5th level), and sub-sub-tasks (6th level) are also used, in some cases, to provide further detailed task descriptions. Only those CWBS accounting codes for which work is anticipated are included in Table III-1.

Table III-1

Civil Works Breakdown Structure

For The Chatham County Regional Flood Control Feasibility Report

J-----Feasibility Report

JA----Engineering Appendix

JAA---Surveying and Mapping

JAAA--Topographic Mapping

JAAB--Water Surface Profiles and Cross-Sections

JAB---Hydrology and Hydraulic Studies/Report

JAC---Geotechnical Studies/Report

JAE---Engineering and Design Analysis Report with Preliminary Drawings

JAEA--Preliminary Design

JAEB--Detailed Design

JAEC--Design Appendix

JB----Socioeconomic Studies/Report

JBA---Economic Analysis/Report

JBB---Social Studies/Report

JBC---Institutional Studies/Report

JBD---Ability to Pay Report

JBE---Financial Analysis Report

JC----Real Estate Analyses/Documents

JCA---Real Estate Supplement/Plan

JCB---Gross Appraisal/Report

JCC---Preliminary Real Estate Acquisition Maps

JCD---Physical Takings Analysis

JCE---Preliminary Attorney's Opinion of Compensability

JCF---Rights of Entry

JD----Environmental Studies/Reports

JDA---Minutes of Scoping Meetings

JDB---Environmental Assessment (EA) and FONSI

JDD---Coordination Documents with Other Agencies

Table III-1 (Continued)

Civil Works Breakdown Structure

For The Chatham County Regional Flood Control Feasibility Report

JDE---Environmental Resource Inventory Report

JDF---Mitigation Analysis Report

JDG---Endangered Species Analysis

JDH---Section 404(b)(1) Analysis Report

JDI---401 State Water Quality Certification

JDL---Statement of Findings

JDM---Coastal Zone Management Consistency Determination

JE----Fish and Wildlife Coordination Act Report

JF----HTRW Studies/Report

JFA---HTRW Preliminary Assessment Report

JFB---HTRW Site Inspection Report

JG----Cultural Resource Report

JGA---Site Survey Field Report

JGB---Data Collection and Analysis

JGC---Mitigation Plan Report

JH----Cost Estimates

JHB---PE&D Cost Estimate

JHC---Project Cost Estimate

JHD---OMRR&R Cost Estimate

JHE---Baseline Fully Funded Cost Estimate

JI----Public Involvement Documents

JIA---Notices & Public Meeting(s)

JIB---Minutes of Public Meeting(s)

JIC---Public Comments Report

JIE---Other Public Involvement Documents

JJ----Plan Formulation and Evaluation Report

JJA---District Coordination Meeting

JJB---Establish Without Project Conditions

Table III-1 (Continued)

Civil Works Breakdown Structure

For The Chatham County Regional Flood Control Feasibility Report

JJC---Preliminary Formulation and Screening of Alternatives

JJD---Detailed Evaluation of Alternatives

JJE---Plan Formulation Management and Report

JQ--Alternative Formulation Briefing

JQA---AFB Project Documentation

JQB---AFB Technical Review Documents

JQC---AFB Policy Compliance Review Documents

JQD---AFB Guidance Memorandum

JK----Draft Report Documentation

JKA---Draft Feasibility Report and NEPA Document

JKB---Public Review Comments

JKC---Project Guidance Memorandum

JKE---Technical Review Documents

JKF---Policy Compliance Review Documents

JL----Final Report Documentation

JLA---Division Commander's Notice

JLC---Final Feasibility Report and NEPA Document

JM----Washington Level Report Approval

JMA---Policy Compliance Review Documents

JMB---Chief of Engineers' Report

JMC---OMB Letter to ASA(CW)

JMD---ASA(CW) Transmittal to Congress

JME---State & Agency Review and NEPA Document Filing Letters

JP----Management Documents

JPB---Coordination Documents

JPC---Study Funds Control Documents

JPE---Minutes of Technical Review Conference

Table III-1 (Continued)

Civil Works Breakdown Structure

For The Chatham County Regional Flood Control Feasibility Report

K-----Project Cooperation Agreement (PCA)

KA----Initial Draft PCA Package

KAA---Initial Draft PCA

KAB---Federal/Non-Federal Allocation of Funds Table

KAC---PCA-Deviation Report

KAD---PCA-Certification of Legal Review

KAE---PCA-Checklist

IV. Organizational Breakdown Structure (OBS)

The Organizational Breakdown Structure (OBS) identifies which organization has responsibility or input for completing each feasibility study task. In addition to identifying task responsibilities, the OBS section includes mechanisms for ensuring proper coordination among the Federal and non-Federal study team members involved in preparing the feasibility study.

A. Organizational Work Responsibilities

The Organization Breakdown Structure (OBS) describes the responsibility of each organization in providing input to and/or completing tasks identified in the Scope of Studies and Work Breakdown Structure. The following paragraphs identify the management and technical responsibilities for the study. Three levels of management responsibility will be used to guide development of the study: the Executive Committee, the Project Review Boards (PRB), and the study management team. This management structure will be formalized in the Feasibility Cost Sharing Agreement (FCSA). Responsibilities for performing the technical feasibility study investigations are identified following the description of the management structure.

1. Executive Committee

As indicated in the Feasibility Cost Sharing Agreement (FCSA), management of the overall study is the responsibility of the Executive Committee, which will be comprised of the Savannah District Engineer; the Deputy District Engineer for Programs and Project Management; the Chief of Planning Division; and the Chatham County Commission (the non-Federal sponsor).

The Executive Committee will meet throughout the study to review study progress, finances, and findings as developed and reported by the study team. The representatives of the non-Federal sponsor, Chatham County, will be equal partners with the Corps representatives on the Executive Committee. The District Engineer and his counterpart from Chatham County will co-chair the committee. The Executive Committee will manage the overall study by: (1) maintaining a working knowledge of the feasibility study, (2) assisting in resolving emerging policy issues, (3) ensuring that evolving study results and policies are consistent and coordinated, (4) directing the study management team, and (5) reviewing and approving decisions made by the study management team.

The Executive Committee will participate in Issue Resolution Conferences (IRCs). The committee is also responsible for resolving any disputes that may arise during the study. The committee will agree on solutions and study direction, which may include study termination. At least one IRC will be held prior to the public distribution of the draft feasibility report to ensure that all issues are resolved before the final report is submitted to higher authority. Additional IRCs will be held, as required, throughout the study to resolve any problems that may arise.

As detailed in the FCSA, the Executive Committee must approve any significant amendments to the FCSA. Significant changes are defined as any modification to the FCSA which increases the total study costs by more than 15 percent. They must also approve any reassignment of work

items between the non-Federal sponsor and the Federal government. The Executive Committee is also responsible for decisions on whether to suspend or terminate studies under conditions of the FCSA. The committee will also resolve any disputes which are not resolved by the study team and will appoint representatives from their respective organizations to serve on the study team.

2. Project Review Boards (PRBs)

PRBs have been established at three levels within the Corps of Engineers to evaluate the status and progress on all studies, projects, and programs. One PRB includes HQUSACE. The HQUSACE PRB is chaired by the Director of Civil Works or designee and includes the chiefs of the elements whose functions are integral to the USACE role in civil works project development. The HQUSACE PRB will review the study only if it determines that it needs intensive management at that level or if recommended by the SAD PRB. The HQUSACE PRB will facilitate resolution of major study issues, concerns, or problems through Corps functional channels and make recommendations to the Director of Civil Works, SAD, and the non-Federal sponsors as part of intensive management. Upon receipt of a Schedule and Cost Change Request (SCCR), the HQUSACE PRB will approve changes in major milestones and significant cost increases in accordance with Engineering Regulation (ER) 5-7-1. The HQUSACE PRB will meet bimonthly.

The second PRB will be chaired by the SAD Commander or designee and include the chiefs of the elements whose functions are integral to the role of the Division in civil works projects. The SAD PRB will review monthly the project executive summary (PES) for compliance with the IPMP and provide comments to the District. The SAD PRB will facilitate resolution or elevate to the Division Commander or higher authority major issues raised during the study, monitor study contingencies and cost changes against the approved study cost estimate, and take appropriate action on schedule and cost change requests, in accordance with ER 5-7-1.

A third PRB will be held by the Savannah District and chaired by the District Commander or his designee. It will include the chiefs of the elements whose functions are integral to the role of the District in civil works projects. The District PRB will review the PES report monthly (along with all others for the District) for compliance with the IPMP and provide comments to the Division and the project manager. The District PRB will facilitate resolution or elevate to SAD major issues raised during the study, monitor study contingencies and costs of changes against the approved study cost estimate, and take appropriate action on SCCRs, in accordance with ER 5-7-1. The District PRB also will approve the IPMP and any significant changes identified by the study management team and recommended by the project manager in accordance with ER 5-7-1. The non-Federal sponsor may attend the District PRB meetings at its discretion.

3. Study Management Team

The study management team will include representatives from the Corps of Engineers, Chatham County, and other agencies, as appropriate. This team will ensure appropriate scopes of services for the technical studies, guide their accomplishment, and participate in plan formulation and selection of potential alternatives. The team will be directly involved in establishing mutual roles for the study team members and in focusing feasibility investigations on the critical issues. Corps

of Engineers representatives will include the study manager and the Chief of the Plan Formulation Branch. Each non-Federal sponsor will also appoint representatives to the study management team. The team will recommend to the Executive Committee the tasks to be conducted and the extent of planning and evaluation to be carried out in the feasibility phase. The team will also report to the Executive Committee and PRB on the results of studies and recommend alternative courses of action for project implementation. Study management team meetings will be held regularly throughout the feasibility phase. Meetings will be held at approximately 1-month intervals, but may be more frequent at critical decision points.

4. Programs and Project Management Division (PPMD)

The PPMD will assign a Project Manager (PM) to be responsible for reporting to the Project Review Board and to prepare required Life Cycle Project Management (LCPM) reports. In addition, the PM will be responsible for monitoring project schedules and finances, processing schedule and cost change requests (SCCR), reviewing budget documents, coordinating preparation of the Project Cooperation Agreement (PCA), and identifying and resolving problems and issues.

5. Planning Division (PD)

A study manager will be assigned from the Plan Formulation Branch and will be responsible for performing study management activities, including: leading the study team, plan formulation, public involvement, preparing study schedules, monitoring the progress of technical work, and developing and preparing the feasibility report. The Economics and Special Programs Branch will be responsible for developing structure inventories, collecting information on depth-damage relationships, coordinating with the Engineering Division to obtain water surface elevations for various flood events throughout the damage reaches, developing economic data and demographic information, evaluating cultural resource impacts, and developing the financing plan. The Environmental Resources Branch will be responsible for assessing environmental impacts, and accomplishing NEPA compliance activities.

6. Engineering Division (EN)

The Engineering Division Technical Manager will be responsible for managing the Engineering Division contribution to the feasibility study. This includes coordinating with the Project Manager and Planning Division study manager regarding the status of engineering work efforts. The Cost Engineering Branch will be responsible for developing cost estimates for initial construction and operation and maintenance of alternative plans, and the selected plan. The Hydrology and Hydraulics Branch will be responsible for conducting hydrologic and hydraulic design studies. The Design Branch will be responsible for developing designs and drawings, structural investigations, and surveying and mapping activities.

7. Real Estate Division (RE)

The Real Estate Division will be responsible for performing all required real estate activities for the project. Real Estate activities will include determining land ownership, developing the real estate gross appraisal, and preparing the real estate plan which will include a baseline cost estimate for real estate, development of a detailed schedule of acquisition milestones, and a general description of the area and total acreage to be acquired, with fee and easement breakdown. The Appraisal Branch will prepare gross appraisals. The Acquisition Branch will obtain rights-of-entry, prepare preliminary real estate acquisition maps and prepare the Real Estate Supplement. The Real Estate Division will also prepare the physical takings analysis and the preliminary attorney's opinion of compensability.

8. Non-Federal Sponsor

The non-Federal sponsor will be involved in all aspects of the feasibility study to ensure that they agree with the findings of the study. The non-Federal sponsor will attend progress meetings, public workshops; provide scientific/technical input to field studies; participate in the plan formulation process; assist in the development of recommended plans; and review reports.

9. Other Study Participants

Numerous agencies/organizations will be consulted throughout the study for their input. Some agencies will participate in all projects including the Metropolitan Planning Commission, and others will only participate in the plan formulation process for specific projects.

B. Description of Coordination Mechanisms

The Chatham County Regional Flood Control feasibility study will require input from many different work elements, the sponsor, and other external organizations, such as consultants, and other government agencies. Proper coordination among these study participants is essential to maintain the project schedule, to avoid duplication of efforts, to detect problems in a timely manner, and to maintain agreement and cooperation on the direction of the study. Therefore, formal coordination mechanisms are described in the PSP.

1. Internal Coordination Mechanisms

Internal coordination mechanisms will be used to ensure that effective internal command, control, and coordination is maintained during the feasibility study. The primary internal coordination mechanisms will be the monthly Project Review Board (PRB) meetings, monthly meetings of the Study Management Team, and Issue Resolution Conferences scheduled at critical phases of the study. An earned value analysis will also be accomplished on a monthly basis. The purpose of the analysis is to assess actual study progress against scheduled progress in regards to both cost and schedule. This analysis also will indicate cost and schedule variances.

A work plan will also be developed on an annual basis which reflects anticipated funding levels and work efforts, based on the IPMP. The District PRB will review monthly the PES report for

compliance with the IPMP and provide comments to the Division and the project manager. The plan will include reports on study progress to date, a schedule for the efforts planned for the coming year, specific work tasks required to complete investigations, estimates of costs from each work group, and other pertinent information. The annual work plans will be approved by the Executive Committee.

2. External Coordination Mechanisms

Coordination outside the Corps of Engineers and non-Federal sponsors will be necessary to ensure the success of the feasibility study. External agency counterparts for the environmental work effort include: U.S. Environmental Protection Agency (EPA), Advisory Council on Historic Preservation (ACHP), U.S. Fish and Wildlife Service (USFWS), State Historic Preservation Officer (SHPO), and the State of Georgia.

2.1 Public Meetings/Workshops

These gatherings will be scheduled throughout the study period to gather input, report on study progress, or to report study findings. The Planning Division Study Manager will arrange for and report on public meetings/workshops.

2.2 Study Briefings and Fact Sheets

Study briefings will be provided and fact sheets prepared throughout the study period for congressional representatives, state and local officials, and others, as appropriate.

C. Development of Resource Codes

A set of Resource Codes have been developed for accounting and administrative purposes. The resource codes presented in Table IV-1 include abbreviations for the names of the technical elements responsible for conducting portions of the feasibility study. These abbreviation are also used in the Responsibility Assignment Matrix (Table IV-2).

Table IV-1
Resource Codes

Resource Code	Technical Element / Resource Code Description
PM	Programs & Project Management Division
PM-P	Programs Management Branch
PD	Planning Division
PD-P	Plan Formulation Branch
PD-E	Environmental Resources Branch
PD-S	Economics and Special Programs Branch
EN	Engineering Division
EN-C	Cost Engineering Branch
EN-D	Design Branch
EN-DS	Structural Section
EN-DG	Civil Design Section
EN-H	Hydrology & Hydraulics Branch
EN-HA	Hydraulics Section
EN-G	Geotechnical Branch
EN-GG	Geology Section
EN-GH	HTRW & Special Studies Section
EN-GS	Soils Section
EN-HS	Survey Section
RE	Real Estate Division
RE-RP	Acquisition Branch
RE-B	Appraisal Branch

D. Responsibility Assignment Matrix (RAM)

The Responsibility Assignment Matrix (RAM) is a tabular representation of the organizational responsibilities for the performance of the work efforts defined in the Work Breakdown Structure and is a required component of the PSP. It defines the intersection of the Organizational Breakdown Structure and the Work Breakdown Structure (WBS). Table IV-2 presents the RAM for the Chatham County Regional Flood Control Feasibility Study. WBS codes (1st through 3rd levels) are represented vertically in the first column of the matrix and adopt the accounting system of the Civil Works Breakdown Structure. The second column includes an abbreviated description of the activity. Resource Codes of the OBS are represented horizontally in the first row of the matrix. The individual cells of the matrix (the intersection of the WBS and OBS) identify the responsible organization for each WBS activity. Lead organizations are identified with a check mark. Supporting organizations are identified with an "s".

Insert Table IV-2 RAM page 1 here

Insert Table IV-2 RAM Page 2

Insert Table IV-2 RAM page 3

V. Feasibility Study Schedule

This section of the PSP defines the schedule for completion of major milestones and tasks for use in monitoring the progress of the feasibility study. The feasibility study schedule includes all critical study tasks, inter-relationships between tasks, key decision points, in-progress reviews, and issue resolution meetings.

1. Major Milestones

The major milestones for the feasibility study are shown below. Milestone dates assume a May 1, 1998 study start and will be adjusted proportionally if study initiation occurs earlier or later.

P-1 Milestone	SAS and Non-Federal Sponsor Sign FCSA	May 1, 1998
P-2 Milestone	Study Initiation	May 1, 1998
P-3 Milestone	In Progress Review Meeting	September 1, 1998
P-4 Milestone	Alternative Formulation Briefing	July 22, 1999
P-5 Milestone	Plan Formulation Report	December 18, 1999
P-6 Milestone	Submission of Draft Feasibility Report	February 17, 2000
P-7 Milestone	Division Commander's Notice	March 9, 2000
P-8 Milestone	Feasibility Review Conference	April 1, 2000
P-9 Milestone	Project Guidance Memorandum	April 13, 2000
P-10 Milestone	Submission of Final Feasibility Report	May 25, 2000

2. Task Dependencies and Timeline for Work Activities

The Gantt chart contained in Figure V-1 below presents the feasibility study schedule for the Chatham County Regional Flood Control project. The Gantt chart shows work activities to the Major Task Level (e.g. JAA – Surveying and Mapping) using the Civil Works Work Breakdown Structure (CWBS) organization. The Gantt chart identifies task dependencies and provides a timeline for work activities. Each Major Task is listed, along with its duration in days. Major Tasks in ***italics*** indicate tasks which are on the critical path. In addition, the Gantt chart provides a visual representation of when the tasks begin, what other tasks are being conducted simultaneously, and milestone dates (shown with a diamond). Following the Gantt chart is a critical path method (CPM) network, shown on Table V-2, which lists task duration, start and finish dates, and dependencies among tasks (i.e., predecessor and successor relationships).

Proj Sched p1

Proj Sched p2

Proj Sched p3

Proj Sched p4

Proj Sched p5

CPM p1

CPM p2

CPM p3

CPM p4

VI. Baseline Feasibility Study Cost Estimate

This section of the PSP presents the cost estimate for the feasibility study. The feasibility study cost estimate is presented in Table VI-1. Study costs are displayed by Federal Fiscal Year at the CWBS Major Task level. The table displays total cost for each major task, the Federal contribution, and the non-Federal contribution (including cash and in-kind services). Table VI-2 displays Federal and non-Federal costs for each major task, by Federal Fiscal Year.

Feasibility Cost Estimate p1

Feasibility Cost Estimate p2

Fed & NonFed Funds p1

Fed & NonFed Funds p2

VII. Quality Control Plan

1. Introduction

Effective 1 Oct. 95, the South Atlantic Division and HQUSACE no longer reviews planning reports for technical adequacy. This responsibility has been placed with the District producing the report. Although SAD and HQUSACE will not conduct a technical review they will review reports for conformance to current policy. As such, the Savannah District is responsible to ensure that its report conforms to all current professional practices and standards by conducting an internal technical review of the report, prior to its submission to SAD and HQUSACE. Policies and procedures defining the quality control / internal technical review process are specified in EC 1165-2-203, "Technical and Policy Compliance Review", 15 October 1996.

2. Quality Control / Internal Technical Review Responsibilities

The goal of the technical review process is to ensure that the report and its sub-components meet the technical standards and regulations of the Corps of Engineers. The Savannah District is responsible for the independent technical review of the feasibility study and its products and will develop and implement a QC plan for the project. The QC plan includes the independent technical review of decision and implementation documents, consistent with established criteria, guidance, procedures, and policy; and identifies how the district plans to ensure compliance with technical and policy requirements.

3. Technical Review Process

Technical review is part of the overall development of implementation and decision documents and is the systematic execution of actions, decisions, and reviews taken during the concept development, formulation of alternatives, and project design phases to ensure conformance with laws and Administration policy. An independent technical review is conducted for all decision and implementation documents and is independent of the technical production of the project/product.

The selected independent technical review methods are identified in this QC plan. The technical review team members have the proper knowledge, skills, and experience necessary to perform their tasks and are independent of the study team responsible for the development of the project/product. The QC/QA process is described herein will be fully documented in the feasibility study. Documentation and certification of technical/legal review will accompany the feasibility report that is submitted to SAD and HQUSACE for policy compliance review.

The Savannah District will apply all appropriate technical and policy guidance in developing Chatham County Regional Flood Control feasibility study. Since the district is responsible for both conducting the work and providing the technical review of the work, the technical review will be independent. Independent review will include review of all the technical work and products from plan formulation, environmental, economics, engineering, cost estimating, real estate, and other disciplines that are essential to achieving a quality feasibility report. A QC plan

has been prepared for this project and is documented in this PSP. The QC plan includes the following items:

(1) Discussion of the selected independent technical review option which identifies the review team members, qualifications, and the rationale for selection.

(2) Schedule of in-progress technical and/or policy reviews.

(3) Description of the process for documenting decisions, issues, and issue resolution.

(4) Discussion of the methods to be used to resolve significant technical and other policy issues.

(5) Discussion of the lessons learned process.

(6) Legal review of the decision document and associated NEPA compliance document by district counsel.

(7) Any issues that cannot be resolved within the district will be forwarded to SAD and HQUSACE for resolution.

It is the responsibility of each technical division within the District to establish its own quality control plan. Based on their input, the following actions will take place during the feasibility study:

1. Planning Division

Environmental Resources: Work performed to produce the environmental analysis and NEPA document may be done, in part, using a contractor. As such, the quality control process will be in two steps. This first will be by the contractor, who will conduct the review in accordance with their internal QA/QC procedures. A copy of EC 1165-2-203 will be provided to the contractor to ensure that their internal QA/QC procedures conform to Corps of Engineers' requirements.

The second step in the QA/QC process will be performed by the Corps planning review team members, who will review the contractor's work to ensure that it meets the requirements of the contract and conforms to the requirements set forth in the PSP and other Corps regulations. For work performed under contract, Mr. Paul Metz is designated as the primary reviewer for environmental work.

Economic and Social Analysis: Quality control and technical review of the economic, social analysis and financial analysis work will be performed by Mr. Richard Hill. His alternate will be Mr. Jeff Morris. For cultural resources work, Ms. Judy Wood will be the primary reviewer.

Plan Formulation: Plan formulation and preparation of the Feasibility Report will be performed under the direction of the Chief of the Plan Formulation Branch, Mr. Leroy Crosby. Mr. Larry Lyons, Plan Formulation Branch, will review plan formulation and serve as the leader of the technical review team. Mr. Lyons has significant experience in plan formulation and will not be

involved in the day to day progress of the study, which will be managed by the Plan Formulation Branch. The main report will also be reviewed by the Chief, Planning Division for compliance with policy.

2. Engineering Division

The draft Engineering Appendix will be reviewed by the Engineering Division. A back check review of the final engineering appendix will be conducted. The review team will consist of individuals from the following fields: civil design, structural, geotechnical, cost estimating, hydraulics and hydrology. Corps of Engineers criteria will be used to judge the technical adequacy of the products and documentation will be accomplished by written comments, responses and correspondence.

3. Review Process

Each technical element will schedule sufficient time for a technical review to allow their appendix to be submitted in accordance with the currently approved PSP. In order to accomplish this, each technical element will conduct its quality control on a continual basis with each major sub-product serving as a check point in the quality control process. This will ensure that any technical mistakes are found early and resolved while the material is fresh in the minds of those working on it. For work performed by a contractor, each contract scope of work will require several work progress updates and submissions prior to the submission of the draft report and final report. These progress updates will serve to ensure that the contractor is proceeding in the direction that the Corps wishes to pursue and raise any issues that may need to be resolved.

Checklists will be used in the quality control process to assist the reviewer, but will not be used to replace that persons technical expertise or judgment. The checklists are designed to assist the reviewer in ensuring that the report contains the minimum amount of material necessary to make decisions and that any conclusions drawn in the report are based on the information provided.

Each reviewer will document their comments on review sheets. At a minimum, each comment will refer to the page and paragraph in question, the nature of the problem, where guidance can be found which applies to the problem, and if possible, a suggested solution to the problem. The comments and any checklist used will be returned to the person responsible for the product to resolve. Responses to each comment will provide, at a minimum, what was done to correct the deficiency and where the deficiency was corrected, or a justification for why the deficiency was not corrected. The package of comments and responses will be attached to the final submission as a sub-appendix. It is the responsibility of the section supervisor responsible for the product to review the comments and responses to ensure that all issues are resolved.

Each line supervisor has the responsibility for the day to day quality control of those they supervise. As such, they are directly responsible for checking the day to day work of their subordinates and resolving any issues that the review team members may raise.

4. Additional Quality Control Measures

In addition to the steps described above, three quality control meetings will be held during the course of the study. The purpose of these meetings will be for the Branch Chiefs and other team members to gain an understanding of what the study team has produced and provide comments and raise issues at the appropriate time. The review team members will provide their written comments on the main report at this time. The three briefings are:

1. Without Project Conditions

2. With Project Conditions

3. Alternative Selection (Note, this briefing will also include participants from SAD, HQUSACE, the non-Federal sponsor, and Federal and state environmental agencies).

5. Approval of Quality Control/Internal Technical Review Plan

Approval of the quality control/internal technical review plan will be done concurrently with the approval of the Project Study Plan. Each person who is named in this plan as a reviewer or alternate will provide their acknowledgment of this responsibility on the attached form.

QUALITY CONTROL REPORT

SAVANNAH DISTRICT - PLANNING DIVISION

CHATHAM COUNTY, GEORGIA

1. I certify that the study and project review was performed and that the study and recommended project meet all Corps regulations and requirements related to water resources planning.

Planning Review Team

Richard Hill _____ Date
Chief, Economics and Special
Programs Branch

_____ _____
Paul Metz Date
Chief, Environmental Resources
Branch

_____ _____
Judy Wood Date
Archeologist

2. I certify that the study and project review process required to be performed under my responsibility has been completed and the subject study and recommended project meet all Corps regulations, requirements and customer expectations.

_____ _____
Leroy Crosby Date
Chief, Plan Formulation Branch

STUDY REVIEW CERTIFICATION

PLANNING DIVISION

CHATHAM COUNTY, GEORGIA

1. I certify that the study and project review process required to be performed under my responsibility has been completed and that the study and recommended project meet all Corps regulations, requirements, and customer expectations.

_____ _____
Myron J. Yuschishin Date
Chief, Planning Division

_____ _____
Joseph H. Rogers Date
Chief, Engineering Division

_____ _____
Tommy R. Hill Date
Chief, Real Estate Division

_____ _____
William A. Hough Date
District Counsel

_____ _____
Grant M. Smith Date
Colonel, Corps of Engineers
District Engineer

QUALITY CONTROL PLAN

SAVANNAH DISTRICT - PLANNING DIVISION

OVERVIEW, BASIC CONCEPTS AND APPLICABILITY

I. Overview

This Quality Control Plan (QCP) has broad application to most of the Savannah District Planning Division General Investigations (GI) functions. This QCP may be expanded, contracted, or otherwise modified based on the risk, cost, complexity and uniqueness of the effort being undertaken. However, this model and each variation is expected to:

A. Explain the concept of how the QCP is integrated with and complements existing structures such as the Project Review Board and existing management tools such as Project Study Plans (PSP) or Project Management Plans (PMP) without usurping the functional responsibilities of PM's , TM's or their chains of command.

B. Establish a concept and process for identifying a specific set of assignments for an independent Technical Review Team not directly involved in the production of the work products to participate in the life-cycle progress of the study/project.

C. Provide a "checklist" or similar tool to aid the Technical Review Team in their mission of assuring that significant items and issues are not overlooked.

II. Basic Quality Control Concept

Quality control is assured by a multi-discipline, multi-layer, life-cycle approach. Successful Planning products are the result of the insights and expertise of a diverse array of professionals, including the active participation of local sponsors and representatives from other pertinent agencies. Work efforts are conducted either by A-E, other districts or by in-house technical staff. If the primary technical work is conducted outside the District, one layer of review will take place by the contractor before transmission the report is transmitted to the Savannah District.

The District Study/Project Team members will conduct a second layer review of the contractor's work products. The next layer of review involves the Group Leaders or Section Chiefs of the Study Team members to assure some degree of completeness, correctness, and consistency since a portion of the functional responsibility for the end-product lies with the technical worker's first line leader or supervisor. This first-line supervisor is intimately involved in the progress of the effort and will not serve as the Technical Review Team Member for his/her discipline. Branch Chief and Division Chief level (overview/policy) reviews are also conducted and they tend to exhibit a greater degree of independence and objectivity than previous layers since they are not involved in the day-to-day production activities. This layer is routinely accomplished as Division Chiefs provide PRB recommendations and approvals. This QCP establishes a separate, independent Review Team as specified on a subsequent page.

The Quality Control Team (QCT) participates in the entire life-cycle of the study/project:

1. The QCT contributes to and reviews the PSP at its inception.

2. QCT provides an intermediate review as major interim products/decision are reached.

3. Specific interim points requiring QCT review are:

    i). Definition of without-project conditions:

    ii). Definition of with project conditions

    iii) Alternative Formulation and screening of alternative plans.

4. The QCT will provide a thorough review of Draft and Final products and identify and resolve problems in conjunction with the Study Team before recommending PRB approval.

Written comments from the QCT will be addressed to the Study Team for resolution. These comments are compiled as part of the Quality Control Report to indicate the issues and concerns which were raised and addressed along the course of the study. Unusual issues or conflicts which cannot be resolved by the Study and Review Teams may be addressed to an appropriate resource in SAD for guidance.

III. Responsibility

The Review Team is required to certify the results of their review as indicated on the enclosed Certification Form within the Quality Control Report.

Study Team members, Technical Managers, Project Managers and Functional Chiefs still retain responsibility for the quality and timely execution of study / project tasks in accordance with milestones, costs and commitments as identified in the PSP. The Review Team provides ancillary quality control, not replacement of existing responsibility for technically accurate, high-quality work products.

IV. Technical Review Team

The Technical Review Team will focus on:

A. Assumptions.

B. Methods, procedures and material used in the analysis based on the study /project scope.

C. Alternatives evaluated.

D. Appropriateness of data used and level of data obtained.

E. Reasonableness of the results, including whether the product meets the customers needs consistent with law and existing policy.

V. Checklists

A checklist for review of Feasibility Reports is enclosed in this Quality Control Plan. It is meant to be an available tool to assist the Review Team Member, not to replace his/her technical expertise or judgment.

CHECKLIST FOR REVIEW OF FEASIBILITY REPORTS

1. Has the study been conducted in accordance with and fully responsive to the study authority?

2. Is the study area, as defined, reasonable and consistent with the study authority?

3. Have the areal extent and severity of the water-resources problems and without-project conditions been clearly documented?

4. Are current findings consistent with prior phases of study? Have intervening external factors (such as regulation changes, significant storm events, etc.) jeopardized previous logic, analyses and conclusions?

5. Have the assumptions and rationale for the without-project condition been explicitly stated and are they reasonable?

6. Are planning objectives clearly identified?

7. Were the views of non-Federal interests solicited and considered in the plan formulation process?

8. Have all reasonable structural and non-structural plans, including a no-action plan, been considered? Do they fully address the identified problems and needs?

9. Was the plan formulation analysis conducted in accordance with accepted techniques and appropriate guidelines and regulations?

10. Was the environmental work conducted in accordance with appropriate techniques, guidelines and regulations?

11. Was the economic/benefit analysis conducted in accordance with accepted techniques, guidelines and regulations?

12. Has the NED plan been identified? Is it the selected/recommended plan?

13. For environmental restoration efforts, was an cost effectiveness and incremental analysis accomplished? Was resource significance defined?

14. Is there a rationale for a locally-preferred plan or non NED recommended plan?

15. Does the recommended plan meet the customer's needs and has the position of the sponsor been explicitly conveyed?

16. Have upstream and downstream effects of the recommended plan been identified?

17. Have all known benefits been included in the benefit estimate? Have high-priority benefits been identified?

18. Have economic methodologies and assumptions been explained in sufficient detail?

19. Is the evaluation of each alternative based on the difference between the without-project and with-project conditions?

20. Have risk and uncertainty been addressed in accordance with ER 1105-2-101?

21. Has the necessary coordination been conducted and documented in accordance with the National Environmental Policy Act of 1969 (NEPA) and ER 200-2-2?

22. Have HTRW considerations been addressed?

23. Is the proposed project recommendation consistent with current administration policies?

24. Does the over-all Planning report adequately display study assumptions, and findings, as well as and clearly represent a firm basis for the recommendation?

VI. Planning Review Team Assignments

Standing assignments for the most common planning products have already been in place within Planning Division with a plan formulation technical specialist and a regional economist already fulfilling this quality control function. The plan for independent review of environmental products is to have a senior environmentalist/archaeologist with significant Corps experience, but with little or no involvement in working on the specific study's day-to-day activities. Specific team member names will be provided at the inception of the study as Study Team and Review Team members are identified. Review team assignments for technical support outside of Planning Division must be provided by those other offices at the appropriate time.

QUALITY CONTROL REPORT

SAVANNAH DISTRICT - PLANNING DIVISION

CHATHAM COUNTY, GEORGIA

Overview

This report synopsizes the Quality Control and Review Process to be employed during the conduct of the Chatham County Flood Damage Reduction feasibility study. In light of the changes in review functions on the Division and Headquarters levels in recent years, the responsibility for review of technical products rests with the district. Each operating Division in the District has developed its own functional procedures and identified its own study Team and Review Team members for quality control of its areas of technical expertise.

Study Team and Review Team Assignments

Discipline	Study Team Member (Name)	Review Team Member (Name)
Plan Formulation / Report Preparation	Planning TM	Elliott Edwards
Economic Analyses	Planning Economist	Jeff Morris
Cultural Analysis	Planning Archeologist	Judy Wood
Environmental Analysis	Planning Biologist	William Bailey
Real Estate	R.E. Specialist	TBD
H&H	Engrg. Hydr. Engineer	TBD
Prelim. Layout/Design	Engrg. Design Engineer	TBD
Geotechnical	Engrg. Geo. Engineer	TBD
Cost Estimating	Engrg. Estimator	TBD

QUALITY CONTROL REPORT

SAVANNAH DISTRICT - PLANNING DIVISION

CHATHAM COUNTY, GEORGIA

Documentation of Technical Review Process

Meetings Attended by Review Team

	Date	Review Team Member	Issue	MFR Attached
1				
2				
3				
4				

Review Team Comments for Interim and Final Submittals

	Date	Review Team Member	Issue	Resolution
1				
2				
3				
4				

Additional Comments Attached

Key Items Addressed by Review Team

a) Validity of technical assumptions
b) Methods and procedures used in the analyses
c) Reasonable alternatives were addressed
d) Appropriateness of data used
e) Reasonableness of the results and responsiveness to customer needs

If a formal checklist has been used by the reviewer, it is attached.

QUALITY CONTROL REPORT

SAVANNAH DISTRICT - PLANNING DIVISION

CHATHAM COUNTY, GEORGIA

Certification by Review Team Members

I certify that the study and review process required to be performed under my responsibility has been completed and the technical work is generally in accord with Corps regulations, standard report requirements and customer expectations.

Review Team Member Date

_____

_____

_____

QUALITY CONTROL REPORT

SAVANNAH DISTRICT - PLANNING DIVISION

CHATHAM COUNTY, GEORGIA

Endorsement by Office Chiefs

My staff and I have reviewed the report and the recommendations of the Study and Review Teams. I endorse the report and recommend its signature by the District Engineer and its continued processing through the Corps approval process.

_____

Myron J. Yuschishin
Chief, Planning Division

_____

Joseph H. Rogers
Chief, Engineering Division

_____

Tommy R. Hill
Chief, Real Estate

_____

William A. Hough
Office of Counsel

VIII. Acronyms

A listing of the acronyms used in this PSP is provided below.

Acronym	Title
ACHP	Advisory Council On Historic Preservation
AFB	Alternative Formulation Briefing
ASACW	Office Of The Assistant Secretary Of The Army (Civil Works)
CEFMS	Corps Of Engineers Financial Management System
CPM	Critical Path Method
CWBS	Civil Works Breakdown Structure
EA	Environmental Assessment
EC	Engineering Circular
ED	Engineering Division
EQ	Environmental Quality
ER	Engineering Regulation
FCSA	Feasibility Cost-Sharing Agreement
FONSI	Finding Of No Significant Impact
FRC	Feasibility Review Conference
GIS	Geographic Information System
HQUSACE	Headquarters, U.S. Army Corps of Engineers
HTRW	Hazardous/Toxic/Radiological Waste
IPMP	Initial Project Management Plan
IRCs	Issue Resolution Conferences
LCPM	Life Cycle Project Management
LERRD	Lands, Easements, Rights-Of-Way, Relocations And Disposal Area

Acronym	Title
MFR	Memorandum For The Record
MOA	Memorandum Of Agreement
NED	National Economic Development
NEPA	National Environmental Policy Act
OBS	Organizational Breakdown Structure
OMB	Office of Management and Budget
OSE	Other Social Effects
PCA	Project Cooperation Agreement
PD	Planning Division
PED	Pre-Construction Engineering And Design
PES	Project Executive Summary
PGM	Project Guidance Memorandum
PM	Project Manager
PMP	Project Management Plan
PPMD	Project And Programs Management Division
PRB	Project Review Board
PROMIS	Project Management Information System
PSP	Project Study Plan
RAM	Responsibility Assignment Matrix
RE	Real Estate Division
RED	Regional Economic Development
RES	Real Estate Supplement
ROD	Record Of Decision

Acronym	Title
SAD	South Atlantic Division
SAS	Savannah District
SCCR	Schedule And Cost Change Request
SHPO	State Historical Preservation Officer
SOF	Statement Of Findings
SOS	Scope Of Studies
TRC	Technical Review Conference
UDV	Unit Day Value
USEPA or EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish And Wildlife Service
WBS	Work Breakdown Structure
WLRC	Washington Level Review Center